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WILDLIFE REVIEW

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NUMBER 105

MARCH 1962

UNITED STATES DEPARTMENT OF THE INTERIOR

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WALDO LEE MCATEE

1883-1962

On January 7, 1962, W. L. McAtee died at Chapel Hill, North Carolina. For 43 years, from 1904-1947, he gave distinguished service to the U. S. Biological Survey and its successor organization the U. S. Fish and Wildlife Service. During that span of time he authored and had published more than 750 papers and books on a wide range of subjects. He was internationally known for his work on the food habits of birds.

We in the wildlife profession are much indebted to Dr. McAtee. Not the least of his numerous contributions to our field was the founding of Wildlife Review in 1935. He not only organized it, but served as its first editor. From 1935 to 1947 he produced 51 issues that contained 6,033 abstracts. From the start this new bibliographic service was hailed as filling a long-felt need. Eloquent expressions as to how biologists and wildlife administrators felt about it are recorded in Wildlife Review No. 3.

In a communication dated March 22, 1953, now on file at the Patuxent Wildlife Research Center, Dr. McAtee tells how Wildlife Review came into being.

> "As papers in the field of Wildlife Management began to multiply, both Aldo Leopold and Ernest G. Holt made the suggestion that a Center should be organized that would stock reprints and make them available to correspondents. They would not have written or talked to me on the subject unless they had in mind my doing the job. I could see plenty of complications and business difficulties in it, so made the counter proposal that an abstracting medium be established.... I proposed to Chief J. N. Darling, if a clerk were provided I would conduct an abstracting leaflet. He agreed, selected the title Wildlife Review from a number submitted.... That was in 1935; I got busy and the first issue was distributed in 1935."

In the 27 years since that time, Wildlife Review has grown in coverage, circulation, and we hope in overall usefulness. The first issue contained 112 abstracts and was distributed to 1000 individuals. A recent issue, No. 103, contained 517 abstracts and was distributed to 3,867 individuals, libraries, and conservation organizations, of which 201 were located in foreign countries. Current issues of the Review no longer have the interesting commentary that characterized the earlier McAtee-edited numbers. Time and space that might have gone into continuance of this feature have been given over to expanding coverage for which there has been great demand.

In tribute to W. L. McAtee we can do no less than continue to strive for the improvement of the abstracting service that he started and ably managed for 12 years. In this effort we invite you to join us.

D H Janzen

Daniel H. Janzen, Director
Bureau of Sport Fisheries
and Wildlife

Waldo Lee McAtee

1883-1962

Founder of Wildlife Review

March 19

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WILDLIFE REVIEW

An abstracting service for wildlife management
Issued for the information of cooperators
by the Fish and Wildlife Service
United States Department of the Interior

March 1962 Patuxent Wildlife Research Center, Laurel, Maryland No. 105

Use of funds for printing this publication approved
by the Director of the Bureau of the Budget, October 3, 1960.

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Except as indicated, abstracts are by Kenneth J. Chiavetta, editor.

NATURAL RESOURCES & CLIMATE

Glading, Ben. (Calif. Dept. Fish & Game, Sacramento.) CALIFORNIA'S PUBLIC LAND ACCESS PROGRAM. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 103-110. 1961 [1962]. WR 105: 2

Of the 100 million acres of land in Calif., 47% is in federal ownership and 3% is in state ownership. The problems of access to this land may be catalogued into 12 major types. The remainder of the paper is concerned with policies, procedure, and priorities of solving these problems.

Seaman, G. A. THE GAME AND FISH RESOURCES OF THE VIRGIN ISLANDS. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 48-53. 1960 [1962]. WR 105: 2

A review of the original fauna, present fauna (mammals, birds, reptiles, and amphibians) and the fishery resources (fresh water, inshore and deep sea) of the Virgin Islands. The introduction of the Javanese mongoose for rat control in 1884 was influential in changing the natural history of the island and it became a much despised and dangerous pest.

SOILS

Coleman, C. S., and others. SOIL SURVEY OF RAPPAHANNOCK COUNTY, VIRGINIA. SCS, Ser. 1958, no. 11. i + 85 p., 18 figs. + single-fold maps based on aerial photos and bound in. Oct. 1961. Sold by Supt. Documents. WR 105: 2

Compy, E. Z. W., and others. SOIL SURVEY OF MONTGOMERY COUNTY, MARYLAND. SCS, Ser. 1958, no. 7. i + 107 p., 1 fig. + folded maps based on aerial photos and bound in. Oct. 1961. Sold by Supt. Documents. WR 105: 2

Dickey, Harold P., and others. SOIL SURVEY OF STEVENS COUNTY, KANSAS. SCS, Ser. 1958, no. 13. i + 33 p., 20 figs. + folded maps based on aerial photos and bound in. Oct. 1961. Sold by Supt. Documents. WR 105: 2

McBee, Charles W., and others. SOIL SURVEY OF GREELEY COUNTY, KANSAS. SCS, Ser. 1958, no. 12. i + 30 p., 21 figs. + folded maps based on aerial photos and bound in. Dec. 1961. Sold by Supt. Documents. WR 105: 2

Includes brief section on wildlife management.

McBee, Charles W., and others. SOIL SURVEY OF HAMILTON COUNTY, KANSAS. SCS, Ser. 1958, no. 10. i + 43 p., 16 figs. + single-fold maps based on aerial photos and bound in. Nov. 1961. Sold by Supt. Documents. WR 105: 2

Includes brief section on wildlife management.

Wells, R. D., and others. SOIL SURVEY OF DOUGLAS COUNTY, GEORGIA. SCS, Ser. 1959, no. 1. i + 85 p., 17 figs. + folded maps based on aerial photos and bound in. Nov. 1961. Sold by Supt. Documents. WR 105: 2

Includes brief section on wildlife.

Wynn, A. H., Jr., and others. SOIL SURVEY OF ISSAQUENA COUNTY, MISSISSIPPI. SCS, Ser. 1959, no. 2. i + 42 p., 6 figs. + folded maps based on aerial photos and bound in. Nov. 1961. Sold by Supt. Documents. WR 105: 2

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Martin, Alexander C., and William D. Barkley. SEED IDENTIFICATION MANUAL. Univ. Calif. Press (Berkeley and Los Angeles). iv + 221 p., 824 photos + 288 figs. 1961. $10.00. WR 105: 2

More than 600 seed species are described and illustrated. In the first part of the book, headed SEED PHOTOGRAPHS, the photographs are organized systematically within 8 plant categories, grouped in 3 ecological sections with headings of Farmlands, Wetlands, and Woodlands. Further aids to identification are provided in the second part entitled IDENTIFICATION CLUES which features sketch and word descriptions that complement the photographs.

PLANTS--GENERAL, ECOLOGY, TECHNIQUES--Continued

Minina, E. G., and L. Ya. Polozova. [EFFECT OF MINERAL FERTILIZERS ON THE BIOLOGY OF FLOWERING AND FRUIT-BEARING IN THE ENGLISH OAK (QUERCUS ROBUR).] Trudy Inst. Lesa Akad. Nauk SSSR 47: 38-50. 1960. [From Biol. Abstr. 36(23), 1961, from Referat. Zhur., Biol., 1961, no. 6G369.] WR 105: 3

Translation [from Russian]. Experiments were carried out in the Stalingrad and Tambov oblasts with the following 5 variations: P; P + N; P + N + K; control; control + trace elements (Zn, Cu, B). Trees which had received P and P + N formed purely vegetative shoots 5-6 times less often than controls. Large initial doses of potassium fertilizer suppressed the formation of male buds; with a complete fertilizer, more female buds were formed. The greatest yield was obtained from oak trees that had received N + P fertilizer, resulting in the formation of a large number (61%) of female shoots. A count of the ovaries and a count of the types of buds, indicated that the N-P mixture had the most favorable effect on the biological processes which determine fruit bearing. P alone or P + K had less effect. The author points out the possibility that mineral fertilizers may increase the resistance of the oak to unfavorable environmental conditions and may increase sexualization, thus stimulating fruit bearing in oak stands.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY

Blake, S. F. GEOGRAPHICAL GUIDE TO FLORAS OF THE WORLD / AN ANNOTATED LIST WITH SPECIAL REFERENCE TO USEFUL PLANTS AND COMMON PLANT NAMES. PART II. WESTERN EUROPE / FINLAND, SWEDEN, NORWAY, DENMARK, ICELAND, GREAT BRITAIN WITH IRELAND, NETHERLANDS, BELGIUM, LUXEMBOURG, FRANCE, SPAIN, PORTUGAL, ANDORRA, MONACCO, ITALY, SAN MARINO, AND SWITZERLAND. USDA, Misc. Publ. no. 797. 1-742 p. Feb. 1961. For sale by Supt. Documents at $2.75. WR 105: 3

The first part of this work (Misc. Publ. no. 401) published in 1942 covered all the world except Europe and Asia. Part II covers Europe with the omission of Germany, the old empire of Austria-Hungary, the Balkans, Poland, and European Russia. Part II differs in scope from Part I principally by including all complete works on pteridophytes, weeds, and poisonous and cultivated plants; by listing a few general works on ecology, phytogeography and related subjects; and by indicating the libraries in which all works not available in Washington were examined or the name of the correspondent who supplied information about them.

Eggler, Willis A., and Walter G. Moore. (Tulane Univ., New Orleans.) THE VEGETATION OF LAKE CHICOT, LOUISIANA, AFTER EIGHTEEN YEARS IMPOUNDMENT. Southwestern Nat. 6(3-4): 175-183, 3 figs. 29 Dec. 1961. WR 105: 3

The original vegetation of the Lake Chicot basin was cypress-tupelo gum swamp bordered by upland hardwood forest. After 18 years of flooding, cypress has decreased in density in the channel but has increased in the shallow peripheral zone. Upland forest trees have all died; a few bottomland hardwoods survive in shallow water. Submerged weedy aquatics (especially cabomba and elodea) dominate the lake. Winter drawdown of the lake level has not solved the aquatic weed problem.--From abstr.

WILDLIFE--NATURAL AREAS & REFUGES

Giles, Robert H., Jr. (Ohio Coop. Wildl. Res. Unit, Columbus.) WILDERNESS AND THE SOUTHEASTERN WILDLIFER. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 282-287, 1 fig. 1959 [1961]. WR 105: 3

The surmountable shortcomings of wilderness are discussed followed by an account of their values (recreational, educational, historical, and scientific). "The establishment and maintenance of permanent wilderness areas of climax vegetational types assumes importance as a management technique for providing at least seasonal food and habitat requirements for many of the more important game species--bear, deer, turkey, gray squirrel, bobcat, and raccoon. Providing a 'habitat refuge' is a passive technique of management requiring no capital outlay and little supervision, but offering possibilities for large forest and swamp management in keeping with the multiple-use concept."

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Cottam, Clarence. (Welder Wildl. Foundation, Sinton, Texas.) THE UNCONTROLLED USE OF PESTICIDES IN THE SOUTHEAST. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 9-18. 1959 [1961]. WR 105: 4

A review paper on pesticide problems of the Southeast in which the pesticide issue, the extent of the control program, research findings on the direct and indirect effects of the control, and the questionable propaganda employed are summarized. A partial solution of the pesticide problem is offered which (1) would have a research branch and an operational branch under the direction of a common administrator, and (2) would involve the use of federal protective legislation "to establish a national control policy requiring that the total toxicants applied shall not result in hazardous conditions to man and his domestic and wildlife resources."

Dunaway, Paul B., and Stephen V. Kaye. (Oak Ridge Natl. Lab., Oak Ridge, Tenn.) EFFECTS OF INDUSTRIAL OIL DISPOSAL ON WILD MAMMALS. J. Mammal. 42 (4): 554-556. Nov. 1961. WR 105: 4

Seven of 9 golden mice trapped near a stream contaminated by waste petroleum products were "cold and moribund." The literature on the harmful effects of petroleum products on wildlife is reviewed.

Finley, Robert B., Jr. (Denver Wildl. Res. Center, Denver, Colo.) DIRECT AND INDIRECT EFFECTS OF SOME INSECTICIDES ON WESTERN WILDLIFE. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 121-129. 1960 [1961]. WR 105: 4

Samples of venison, from 4 mule deer, upon analysis yielded DDT residues. The area from which these deer were taken had been sprayed with DDT (1 pound per acre) a few months earlier. For two samples of fat the levels were 6 and 9 ppm; this approximates the tolerance limit set by U. S. Food & Drug Admin. for beef (7 ppm). The four samples of lean meat contained approximately 1 ppm. Reports of a preliminary nature are presented on aldrin pollution of lakes, field studies of grasshopper insecticides, toxaphene and sevin tests, and both direct and indirect effects are noted.

Hunt, Eldridge G. (Calif. Dept. Fish & Game, Sacramento.) CALIFORNIA'S INVESTIGATIONS REGARDING PESTICIDE PROBLEMS. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 159-164. 1961 [1962]. WR 105: 4

There is an increased trend toward aerial application of pesticides in Calif.: In 1946 approximately 300,000 acres were treated--in 1959 more than 5.8 million acres were treated. Both field and laboratory studies are conducted in this state. "It was apparent from...studies involving the indirect effects on wildlife of...chlorinated hydrocarbon insecticides that there is no predictable safe level of application when these toxic materials enter the food chain. Applications at sublethal levels may be rendered lethal to one or more species in the food chain as a result of the concentration and accumulation of the toxic ingredient by the various relatively resistant organisms in the chain." The advantages and disadvantages of the bio-assay techniques used in Calif. are listed.

Müller, Paul, editor. DDT / THE INSECTICIDE DICHLORODIPHENYLTRICHLOROETHANE AND ITS SIGNIFICANCE. VOL. II. HUMAN AND VETERINARY MEDICINE. Vol. II edited by S. W. Simmons. Birkhauser Verlag, Basel & Stuttgart. 570 p., 63 figs. 1959. WR 105: 4

This volume consists of 3 parts each written by a specialist: Pharmacology and toxicology of DDT, W. J. Hayes, Jr.; The use of DDT insecticides in human medicine, Samuel W. Simmons; and The use of DDT in veterinary medicine, E. F. Knipling. One chapter of the first part entitled "Hazards to Wildlife" contains sections on the effects of application of DDT directly to water, to nonagricultural lands, and to agricultural lands. There are long lists of literature appended to each part--there are 685 references cited in part one. These reflect for the most part work done prior to 1951.--Courtesy/ William H. Stickel.

Robertson, William B., Jr., and Hugh Bell Muller. (Everglades Natl. Park, Homestead, Fla.) WILD WINDS AND WILDLIFE. Audubon Magazine 63(6): 308-311, illus. Nov.-Dec. 1961. WR 105: 5

An evaluation of the effect of Hurricane Donna (Sept. 1960) upon birds in Everglades Natl. Park. As of May 1961, surveys revealed 621 dead birds of 20 species. Estimated losses of herons, egrets, ibis, and roseate spoonbills were 10,000. Of 41 bald eagle eyries in good repair, only 5 remained after the hurricane. Ultimately, new nests were built near 26 of 36 former sites. Total production in 1961 of bald eagles was slightly above that of 1960. Christmas bird counts (1960) in the storm area indicate that most resident land birds decreased 50% or more from the numbers of the previous year.

Steiner, P., and W. Gruch. (Inst. Pflanzenschutzmittelprüfung, Braunschweig, Germany.) TOXICOLOGY OF INSECTICIDES. I. DIENE GROUP. Mitt. Biol. Bundesanst. Land-u. Forstwirtsch., Berlin-Dahlem 95: 1-118. 1959. [From Biol. Abstr. 36 (24), 1961.] WR 105: 5

A review of the chemistry, toxicity to insects, fish, and warm-blooded animals, pathology, residues, tolerance studies, and effects on food flavor for aldrin, dieldrin, endrin, isodrin, chlordan, heptachlor, and hexachlorocyclopentadiene. Numerous references.--Courtesy/ Chem. Abstr.

Worrell, Albert C. (Yale Univ., New Haven, Conn.) PESTS, PESTICIDES AND PEOPLE. Am. Forests 66(7): 39-81. July 1960. WR 105: 5

Truly an essay of enlightenment and scholarly analysis of the pesticide problems. The author recognizes the necessities of pest control and tries to resolve the differences among the users, regulators, influencers, fact finders, manufacturers, and commercial applicators with a set of criteria. ((1) The ultimate test must be the effect of the action on public interest rather than individual, (2) the benefits and costs used in testing the action must be real benefits and real costs in terms of basic human goals, and (3) the benefit must be as great as any alternate of equal cost, the benefits must be greater than the cost, and the costs must be less than the alternates.) The criteria are tested in the history of gypsy moth eradication efforts and fail because costs and benefits are largely lacking. The present decision-making process is reviewed and the point emphasized that many individuals and groups enter into any use of pesticides today. "The serious problem is that individual single actions and programs may appear to be rational and justified in the public interest when tested only in terms of their own separate costs and benefits." But what of the composite picture when many individuals reach similar conclusions? "The greatest need...lies in providing means of analyzing the composite situation and determining the costs, benefits and values involved." In addition, increased knowledge of pest control and pesticides is thought to be sorely needed, especially as it might relate to new means of pest control.--Stuart P. Davey.

WILDLIFE--PARASITES & DISEASES

Harkema, Reinard. (N. C. State Coll., Raleigh.) THE ECOLOGY OF ENDOPARASITISM IN WILDLIFE POPULATIONS. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 166-169. 1959 [1961]. WR 105: 5

Certain aspects of the ecology of parasitism are noted: life-histories, bionomics of host, eggs and larvae, climatic and edaphic factors and the habitat.

WILDLIFE--BIOMETRICS

Gross, Jack E. (N. Mex. Dept. Game & Fish, Santa Fe.) THE NEED FOR QUALITY CONTROL IN THE ANALYSIS OF WILDLIFE MANAGEMENT DATA. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 111-113. 1961 [1962]. WR 105: 6

Much of the data compiled for wildlife management purposes leads to somewhat ambiguous conclusions that do not attain accuracy merely due to the apparent excellence of the sampling technique. The important point to clarify is that variation occurs in all sample data, and that recognizing this variation does not weaken the value of the data, but assigns a more reliable picture of the population condition being investigated. The desired analysis of raw data can be accomplished relatively easy by use of simple statistical analysis.--Prom summ.

Smith, R. H. (Ariz. Game & Fish Comm., Phoenix.) RESULTS OF PILOT WORK ON A SMALL GAME HUNTER TAKE SURVEY. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 168-171. 1961 [1962]. WR 105: 6

Two independent surveys, with approximately 500 contacts on each, were made. One involved tally card holders and the other was a random post-seasonal survey. A follow-up was sent to non-respondents in each case. Results are summarized in 3 tables and the inherent biases of the 2 systems are analyzed.

WILDLIFE--TECHNIQUES

Cole, Glen F. (Mont. Dept. Fish & Game, Helena.) KEY BROWSE SURVEY METHOD. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 181-186, 3 figs. 1959 [1960]. WR 105: 6

This paper describes a method for obtaining yearly condition and use data from key browse plants within key range areas. Data from different years are compared to determine trends. The method is particularly suited to situations where management data from large areas must be obtained by few investigators.

Gilbert, Paul F., and Albert G. Hahn. (Colo. Game & Fish Dept., Denver.) THE PRACTICAL USE OF AERIAL PHOTOGRAPHS IN GAME AND FISH MANAGEMENT. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 223-228. 1959 [1960]. WR 105: 6

New equipment, materials, and techniques in aerial photography are constantly being developed. The value and importance of aerial photographs to game administrators and wildlife biologists are rapidly being recognized. It is possible to plan censuses and conduct studies, evaluate game habitat, and bargain more intelligently on land purchases by using aerial photographs.--From summ.

Marshall, William H., Gordon W. Gullion, and Robert G. Schwab. (Univ. Minn., St. Paul.) EARLY SUMMER ACTIVITIES OF PORCUPINES AS DETERMINED BY RADIO-POSITIONING TECHNIQUES. J. Wildl. Mgmt. 26(1): 75-79, 1 fig. Jan. 1962. WR 105: 6

Three porcupines (Erethizon dorsatum) were located at dawn, midday and dusk over a 30-day period by using 50 g radio transmitters and a portable locator. Movements, habitat selection, relation between young and adult, preference for tree species and/or ground level shelters, influence of mosquitoes, and food taken by these animals are discussed.--Auth. abstr.

Owens, Dwight E. (Colo. Dept. Game & Fish, Grand Jct.) THE USE OF HELICOPTERS IN GAME MANAGEMENT. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 229-232. 1959 [1960]. WR 105: 6

Fixed-wing and helicopter performances in aerial surveys are compared. Helicopters, though slower than airplanes, are safer and the resulting counts of elks were from 15% to 39% higher. The performances of 4 types of helicopters (12C Hiller, H-21, H-19 Sikorsky, and Bell H-13) are compared. "The helicopter may not provide the complete answer for aerial census work but will provide us with the equipment that will give more nearly accurate information needed to properly manage our big game herds."

Schadle, Daniel P. (Ariz. Game & Fish Dept.) ARIZONA'S RAINWATER CATCHMENT. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 163-167. 1960 [1961]. WR 105: 7

Summary: Arizona's first attempt to provide free and permanent water for wildlife was primitive but led the way to larger and more efficient water developments. Many undesirable construction features were eliminated by following the recommendations of the catchment evaluation project. Concrete catchments were altered to satisfy the need for greater water storage and permanency. A new prefabricated, galvanized catchment was designed and sixteen units were constructed in bighorn sheep habitat of western Arizona. The all-purpose type rainwater catchment has replaced the "gallinaceous guzzler" in Arizona.

Trumbo, H. A., and W. B. Chappell. (Va. Polytech. Inst., Blacksburg.) TECHNIQUES INVOLVED IN THE USE OF CHEMICALS FOR ESTABLISHING WILDLIFE CLEARINGS. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 34-38, 1 fig. 1959 [1961]. WR 105: 7

Penuron and monuron are the most effective herbicides for killing a greater proportion of the tree species. Ammate might be used to produce browse in areas where browse is needed since this material induces sprout production. The use of 2,4,5-T in spaced ax-cut frills is not a satisfactory method of creating openings. "Herbicides as a wildlife management tool shows great promise for creating wildlife clearings and controlling undesirable tree and shrub species. It is improbable that they will replace bulldozing as a method of creating clearings; what is to be accomplished and accessibility of areas will be the determining factors."--From summ.

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

PROCEEDINGS OF THE THIRTY-NINTH ANNUAL CONFERENCE OF WESTERN ASSOCIATION OF STATE GAME AND FISH COMMISSIONERS, Portland, Oregon, June 29, 30 and July 1, 1959. xxii + 441 p., mimeo. [1960.] $2.00, paper, from Ben Glading, Calif. Dept. Fish & Game, 722 Capitol Ave., Sacramento 14, Calif. WR 105: 7

A paper-bound volume that contains 76 consecutively paged papers on fish and game problems and resolutions. Most of the technical game papers are entered in this issue of WR. There are 18 technical fisheries papers, 13 conservation education papers, and 6 law enforcement ones. There are groups of commissioners' technical papers dealing with problems of public land management.

PROCEEDINGS OF THE FORTIETH ANNUAL CONFERENCE OF WESTERN ASSOCIATION OF STATE GAME AND FISH COMMISSIONERS, Salt Lake City, Utah, June 20-22, 1960. xxii + 407 p., mimeo. [1961.] $2.00, paper, from Ben Glading, Calif. Dept. Fish & Game, 722 Capitol Ave., Sacramento 14, Calif. WR 105: 7

The 72 papers in this paper-bound volume of proceedings are grouped as follows: General Sessions, 14; Commissioners' Technical Session, 8; Game Technical Session, 18; Fisheries Technical Session, 22; Conservation Law Enforcement Technical Session, 6; and Information and Education Technical Session, 4. Most of the technical game papers are entered in this issue of WR.

PROCEEDINGS OF THE FORTY-FIRST ANNUAL CONFERENCE OF WESTERN ASSOCIATION OF STATE GAME AND FISH COMMISSIONERS, Sante Fe, New Mexico, June 12-14, 1961. xii + 295 p., mimeo. [1962.] $2.00, paper, from Ben Glading, Calif. Dept. Fish & Game, 722 Capitol Ave., Sacramento 14, Calif. WR 105: 7

Of the 56 papers contained in this paper-bound volume, 12 are technical game papers; 10, technical fisheries papers; 6, law enforcement papers; 4, information or education papers; and the remainder are general papers. Most of the technical game papers are entered in this issue of WR.

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL--Continued

Webb, James W., editor. PROCEEDINGS OF THE THIRTEENTH ANNUAL CONFERENCE SOUTHEASTERN ASSOCIATION OF GAME AND FISH COMMISSIONERS, October 25-27, 1959, Baltimore, Maryland. Printed at Columbia, S. C., by SE Assoc. Game & Fish Comms. v + 407 p., illus. [1961.] $2.00 from J. W. Webb, Secy.-Treas., Box 360, Columbia, S. C. WR 105: 8

A thick, well-printed volume of proceedings in a convenient (6" x 9") size. It contains 77 papers, 31 of them from the technical game sessions (10 of these are also published separately by the Md. Dept. Res. & Educ. as Symposium on the Gray Squirrel), 19 from technical fisheries sessions, 9 from information and education sessions, 6 of a general nature and 3 special reports (on stream values, wetland and water use studies, and the small watershed program). Most of the technical wildlife papers are entered in this issue of WR.

Webb, James W., editor. PROCEEDINGS OF THE FOURTEENTH ANNUAL CONFERENCE SOUTHEASTERN ASSOCIATION OF GAME AND FISH COMMISSIONERS, October 23-26, 1960, Biloxi, Mississippi. Printed at Columbia, S. C., by SE Assoc. Game & Fish Comms. v + 284 p., illus. 1960 [1962]. $2.00 from J. W. Webb, Secy.-Treas., Box 360, Columbia, S. C. WR 105: 8

This volume is of the same general size and format of the printed proceedings of this organization since the 1955 meeting. It contains 51 papers, 13 of them from the technical game sessions, 21 from the technical fisheries sessions, one special report on mourning doves, and 16 papers from the general, law enforcement or information and education sessions. Most of the technical wildlife papers are entered in this issue of WR.

WILDLIFE--HUNTING AREAS & PROBLEMS

Hay, Keith G. (Colo. Dept. Game & Fish, Denver.) TECHNIQUES FOR EVALUATION OF ACCESS PROBLEMS. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 191-196. 1959 [1960]. WR 105: 8

In this paper the access problem is defined, causes for the problem are stated, and the procedures and techniques used by Colo. in its evaluation are outlined. Ten recommendations for solving the problem are made.

Moody, Raymond D. PUBLIC RECREATION ON PRIVATE LANDS IN THE SOUTHEAST. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 50-54. 1959 [1961]. WR 105: 8

An analysis of the use, ownership facilities, and principal problems of 46.2 million acres of forest industry lands in the Southeast. Of this acreage 92.4% was open to hunting and 96.3% was open to fishing.

Thornton, James E. (Va. Comm. Game & Inland Fisheries, Harrisonburg.) THE MANAGEMENT OF UPLAND GAME ON PUBLIC LANDS IN VIRGINIA. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 78-84. 1960 [1962]. WR 105: 8

Acreages of public hunting areas in the SE are tabulated by state and ownership. Total area is more than 2.3 million acres. Game management practices used on the Va. National Forests are outlined.

WILDLIFE--FOOD HABITS & TECHNIQUES

Goodrum, Phil D. (Bur. Sport Fisheries & Wildl., Nacogdoches, Texas.) ACORNS IN THE DIET OF WILDLIFE. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 54-61. 1959 [1961]. WR 105: 8

Oak mast is one of the most important wildlife foods in the South. It ranks high in nutritive content, volume and frequency of consumption, and it is available for long periods. Based on currently available data on food requirements and average yearly acorn yields for several oaks, 5 game species need about 57 and 34 pounds of acorns, fresh and air-dry, respectively, to satisfy their requirements for 180 days. An average of four 18-inch water oaks or eight 22-inch postoaks per acre will provide this poundage of acorns. The

presence of several species will lessen the chance of a complete crop failure, for if one species fails another will likely produce. Some modification in the hardwood removal program is desirable since the heaviest mast producers are the bigger trees and it takes from 20 to 75 years to grow a good mast producer.--Prom summ.

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Boyd, Raymond J. (Colo. Game & Fish Dept., Montrose.) AN EVALUATION OF SPRING GRAZING ON ALFALFA BY DEER IN WESTERN COLORADO. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 130-147 + 3 figs. 1960 [1961]. WR 105: 9

Based on a 3-year study. "All statistical analysis used in this study indicated that spring grazing had no harmful effect upon the production of alfalfa hay."

Kverno, Nelson B. (Bur. Sport Fisheries & Wildl., Olympia, Wash.) PROGRESS IN DEVELOPMENT OF SYSTEMIC CHEMICALS TO PROTECT PLANTS. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 187-190. 1959 [1960]. WR 105: 9

"Except possibly for the commensal rodents, developmental chemical research to support wildlife management has been woefully inadequate."

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

New Jersey. ANNUAL REPORT OF DIVISION OF FISH AND GAME FOR THE FISCAL YEAR COMMENCING JULY 1, 1960 AND ENDING JUNE 30, 1961. 1-68 p., illus. [1961.] WR 105: 9

In the wildlife management section (p. 38-50), sex, age and harvest data on deer are summarized; the small game harvest estimates for 1960-1 are compared with those of 1959-60; and the progress in habitat restoration, game liberation and investigational activities are summarized. An increase in hunters is reported. To satisfy present as well as future needs, public holdings [which now amount to 87,000 acres] should be trebled. Harvests of squirrel, pheasant, and brant have increased, but harvests of rabbit, quail, duck, and grouse have decreased.

Saskatchewan. ANNUAL REPORT OF THE DEPARTMENT OF NATURAL RESOURCES...FOR THE FISCAL YEAR ENDED MARCH 31, 1961. Queen's Printer (Regina). 1-160 p., illus. 1961. WR 105: 9

In the 24-page report of the Wildlife Branch, wildlife research and harvest results are summarized. Reference data are presented in tables on game and fur prosecutions by act, age and occupation of offenders, value of wild fur pelts 1959-60 vs. 1960-61, and the estimated big game and game bird harvest for the 1960 season.

West Virginia. [ANNUAL REPORT, CONSERVATION COMMISSION, FISCAL YEAR 1960-1.] W. Va. Conserv. 25(10): 1-48, illus. Dec. 1961. WR 105: 9

The section on Game Management (p. 4-12) includes summaries of research projects on deer, migratory game birds, forest game, and the evaluation of farm game habitat development. There are also reports on studies and habitat development on management areas.

WETLANDS & WILDLIFE

Chabreck, Robert W. (La. Wild Life & Fisheries Comm., Grand Chenier.) COASTAL MARSH IMPOUNDMENTS FOR DUCKS IN LOUISIANA. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 24-29. 1960 [1962]. WR 105: 9

Summary: As a part of a waterfowl management program, the La. Wild Life and Fisheries Comm. began constructing marsh impoundments on certain refuges in 1954. Nine impoundments with a total area of 18,290 acres were completed in

1956 on Rockefeller Refuge. Studies in 1959 revealed that good duck food plants made up 50% of the vegetative composition of the impoundments; but in adjacent control areas these plants made up less than 5%. Over 400,000 ducks wintered on the 84,000-acre refuge and of this number 80% were found in the impoundments. Impoundments should be constructed only in areas which will support a suitable levee. Structures should be installed in any impoundment system to facilitate water level manipulation.

Neely, William W. (SCS, Walterboro, S. C.) MANAGING SCIRPUS ROBUSTUS FOR DUCKS. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 30-34. 1960 [1962]. WR 105: 10

To generate and increase stands of Scirpus robustus, it is necessary to gradually fluctuate the water level from a saturated soil condition to six or eight inches of flooding and down again. The fluctuation is done during the spring, summer, and early fall, requiring about 30 days for each complete cycle. A simple water control device is described which automatically permits this fluctuation and which requires little attention. There are no critical requirements in the system. If adverse conditions cause excessively deep flooding for several weeks, it is tolerated by the plants. The greatest caution is to prevent complete drying of the soil. When the trials were first begun, it was feared the fields would rapidly be taken over by tropical cattail (Typha domingensis) which also grows in this range of salinity. However, this has not been the case. Dominant stands of big cordgrass (Spartina cynosuroides) have been eliminated by this method of management.--From summ.

Steenis, John H., and John Warren. (Patuxent Wildl. Res. Center, Laurel, Md.) MANAGEMENT OF NEEDLERUSH FOR IMPROVING WATERFOWL HABITAT IN MARYLAND. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 296-298. 1959 [1961]. WR 105: 10

Summary: Needlerush, one of the most prominent plants of the southern coastal marshes, dominates an area of about 600,000 acres. Studies in Maryland showed that derivatives of 2,4-D, particularly 2,4-D acetamide, provide the most effective, economical control. Continuous flooding of treated areas prevents reinvasion of needlerush. Marshes dominated by needlerush can be improved for waterfowl by flooding and herbicidal treatments that create an interspersion of marsh and open water suitable for the growth of submerged food plants.

FARMLAND & WILDLIFE

Wunz, Gerald A. (Ky. Dept. Fish & Wildl. Resources, Frankfort.) AN EVALUATION OF FARM GAME MANAGEMENT PRACTICES IN KENTUCKY. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 73-79, 3 figs. 1959[1961]. WR 105: 10

It is concluded that perennial plantings produced no measurable effects on quail and rabbit populations.

RANGELAND & WILDLIFE

Drobnick, Rudy. (Utah State Dept. Fish & Game, Magna.) A METHOD OF SELECTING BROWSE REVEGETATION SITES. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 167-173, 1 pl. 1959 [1960]. WR 105: 10

Since many browse seedlings in range revegetation projects are killed by early and late spring frosts, it is believed that browse seedling mortality from frosts may be less within established inversion zones. Additional research is necessary to establish the exact limits of these warmer microhabitats before any reseeding projects are undertaken in the inversion areas.--From summ.

Gibbens, R. P. and A. M. Schultz. (Univ. Calif., Berkeley.) MANIPULATION OF SHRUB FORM AND BROWSE PRODUCTION IN GAME RANGE IMPROVEMENT. Calif. Fish & Game 48(1): 49-64, 9 figs. Jan. 1962. WR 105: 11

The effect of different periods of protection on the form and production of browse plants was studied on a deer winter range in Calif. during 1955-1960. Sprouting species grew rapidly following manipulation (mashing and burning of mature, mixed chaparral), and a single year of protection allowed them to escape the deer. Two years of protection appeared to be the best treatment for wedgeleaf ceanothus, and continuous browsing seemed best for chaparral whitethorn. Western mountain mahogany and flannel bush develop a tree-like, largely unavailable form even under long periods of heavy use. Browsing pressure greatly influences the form of plants, and through manipulation of this factor, desirable forms may be maintained. Plant density also affects the form of plants and may be manipulated by cultural and grazing practices. Cattle might be used to provide greater flexibility and control of browsing and grazing pressure.--From summ.

Harper, Hugh A. (Idaho Dept. Fish & Game, Boise.) BROWSE REVEGETATION IN IDAHO. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 175-180. 1959 [1960]. WR 105: 11

Bitterbrush (Purshia tridentata) was selected from the more than 30 spp. examir as the most promising browse species for revegetation in Idaho. Sir 1950 about 2500 acres of big game winter range have been planted in browse species. The program is geared to planting about 200 to 300 acres annually. Planting methods, seed treatment, and insect and big game damage are considered.

Plummer, A. Perry, and Homer D. Stapley. (Intermountain Forest & Range Expt. Sta., Ephraim, Utah.) RESEARCH IN GAME FORAGE RESTORATION IN UTAH. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 159-166. 1959 [1960]. WR 105: 11

For direct seeding on deer winter range in Utah the most promising shrubs rank thus: antelope bitterbrush (Purshia tridentata), golden currant (Ribes aureum), big sagebrush (Artemisia tridentata), rubber rabbitbrush (Chrysothamnus nauseosus), Stansbury cliffrose (Cowania stansburiana), fourwing saltbush (Atriplex canescens), blueberry elder (Sambucus cerulea), Tatarian honeysuckle (Lonicera tatarica), mountain snowberry (Symphoricarpos oreophillus), true mountain mahogany (Cercocarpus montanus), and western virginsbower (Clematis ligusticifolia). Promising herbs and grasses are also listed. Seeding and transplanting techniques are described.

FORESTLAND--FORESTRY & ECOLOGY

Yeager, Lee E. (Colo. Coop. Wildl. Res. Unit, Ft. Collins.) CLASSIFICATION OF NORTH AMERICAN MAMMALS AND BIRDS ACCORDING TO FOREST HABITAT PREFERENCE. J. Forestry 59(9): 671-674. Sept. 1961. WR 105: 11

Species or groups of mammals and birds are classified according to their forest-dwelling affinities. Of 369 species of mammals, 93 prefer forest or brushland, and 86 show a secondary preference for forest or brushland-types. For the 714 species of birds, these preferences are 195 and 201 respectively.

FORESTLAND--MANAGEMENT FOR & DAMAGE BY WILDLIFE

Fingland, J. A. (Owen Sound, SE Ontario, Canada.) ARSENITE AND OLD TREES. Sylva (Toronto) 16(6): 9, illus. 1960. [From Biol. Abstr. 36(24), 1961.] WR 105: 11

Sodium arsenite, sold commercially as Atlas A, is the most effective poison for clearing forests of old rotten trees and cull trees. On a 50-acre block of hardwoods a 4-man crew poisoned 10,000 trees in 2 weeks. Almost 100% kill was obtained on hard and soft maples, beech, basswood, elm, cherry, ironwood, ash, and yellow birch.--M. Korr.

Heacox, F. F., and William H. Lawrence. (Weyerhaeuser Company, Tacoma, Wash.) INDUSTRIAL FORESTRY AND WILDLIFE -- THE NORTHWEST. J. Forestry 60 (1): 10-13, 2 figs. Jan. 1962. WR 105: 12

A brief review of forest wildlife damage problems in the Northwest. Economic loss figures are given as well as a breakdown of expenditures by industrial forest owners for control and prevention of wildlife damage to forest crops during 1959. Efforts to control damage by game and non-game species are outlined.--W. H. Lawrence.

Lightfoot, W. C., and W. W. Hines. (Oreg. State Game Comm.) FACTORS ASSOCIATED WITH THE MEASUREMENT OF ANIMAL DAMAGE TO DOUGLAS FIR PLANTATIONS. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 211-216. 1960 [1961]. WR 105: 12

Initial findings indicate that blacktail deer densities are much higher in Douglas fir plantations than previously estimated and that the impact of the deer population upon conifers is not in direct proportion to animal density. Future manipulations of deer numbers within the enclosure should reveal the density of deer that can be maintained without serious conflict with reforestation programs.

Moore, William H., Thomas H. Ripley, and Jerome L. Clutter. (Ga. Game & Fish Comm.) TRIALS TO DETERMINE RELATIVE DEER RANGE CARRYING CAPACITY VALUES IN CONNECTION WITH THE GEORGIA FOREST SURVEY. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 98-103, 2 figs. 1960 [1962]. WR 105: 12

The three major types tested (slash pine, pine-hardwood, water oak-gum) differed significantly in distributions of browse. Partitioning indicated that major and highly significant differences existed between pine and the two hardwood types, but there was no significant differences between hardwood types. Other analyses included tests and detection of significant difference in browse distributions on the basis of stand size and site. Although the data do not give a quantitative estimate of the browse present, results show that this type of sampling gives a sensitive measure of occurrence and relative qualitative difference in communities. Further, these data should suggest silvical practices which would provide high, long-term yields of forage.--From summ.

Strode, Donald D., and E. B. Chamberlain, Jr. (Fla. Game & Fresh Water Fish Comm., Tallahassee.) WILDLIFE HABITAT MANAGEMENT IN FLORIDA NATIONAL FORESTS. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 38-50, 1 fig. 1959 [1961]. WR 105: 12

Cooperative wildlife habitat improvement programs described and discussed in this paper include: power line rights-of-way, control burning, "double burn", road rights-of-way, titi, pine site preparation, and wildlife food plots. In most instances this work has resulted in an increased supply of preferred wildlife food species with an increase in the quality of the foods. Increased wildlife utilization was noted in those areas receiving wildlife habitat improvement.--From summ.

CONTROL OF VEGETATION WITH HERBICIDES ETC.

Ball, Edwin W. AERIAL TREATMENT OF PEST PLANTS WITH HERBICIDES ON NATIONAL WILDLIFE REFUGES IN THE SOUTHEAST. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 259-267. 1959 [1961]. WR 105: 12

A summarization of the results of low volume aerial applications of herbicides on Typha spp., Sesbania macrocarpa, Nelumbo pentapetala, Raphanus spp., Alternanthera philoxeroides, Juncus roemerianus, Eichornia crassipes, Jussiaea grandiflora, Nymphaea odorata, Sagittaria lancifolia, Panicum hemitomon, Melochia corchorifolia, Nuphar advena, Zizaniopsis miliacea, Jussiaea diffusa, Salix spp., Myrica cerifera, Baccharis halimifolia, and Borrichia frutescens.

Hardcastle, W. S. (Univ. Ga., Athens.) PROGRESS REPORT: AQUATIC VEGETATION CONTROL. PART ONE "FIELD CONDITIONS AND FIELD OPERATIONS". La. Conservationist 13(12): 6-8, 23-24, illus. Dec. 1961. WR 105: 13

During the past 4 years approximately 80,000 acres of water hyacinth, alligator weed, and other aquatic weeds have been treated in Louisiana. Boats and pumping equipment for the application of 2,4-D have proved more effective than aerial application in water hyacinth control. Spraying is an all year operation but spring and summer applications are the most effective ones.

McDermott, R. E., and W. R. Byrnes, editors. (University Park, Pa.) HERBICIDES AND THEIR USE IN FORESTRY / PROCEEDINGS FORESTRY SYMPOSIUM / AUGUST 30 AND 31, 1960. School of Forestry, Pa. State Univ. 120 p. Aug. 1961. $2.00. WR 105: 13

A valuable reference to those engaged in land management--particularly forest management and its attendant phases of timber, recreation, wildlife, and water. The following papers are included: Commercial development and appraisal of herbicides for use in forestry, J. H. Kirch, R. H. Beatty, and R. R. Johnson; Present status and trends of herbicides in forest management, Mark G. Wiltse; Physiological characteristics of herbicides, B. J. Rogers; State and federal regulations and liabilities, Jack Dreessen; State agency policies, H. H. Iurka; Food and cover modifications, James S. Lindzey; Aquatic weed control, John H. Steenis; Some primary and secondary effects of herbicides on wildlife, John L. George; Silvicultural applications of herbicides: general problems and a short historical review, W. E. McQuilkin; Herbicides and their use in forest tree nurseries, Thomas S. DeLong; Woody brush control, William R. Byrnes; Control of herbaceous plants, Kenneth L. Carvell; Ground treatment of overstory and understory vegetation in existing stands: with special emphasis on Japanese honeysuckle, S. Little; Techniques of application from the ground, Robert R. Morrow; Aerial application of herbicides for release and conversion, John L. Arend; and Utility right-of-way, roadside, trail and recreation area maintenance, W. R. Rossman.

Peevy, Fred A. (USDA, Alexandria, La.) EVALUATION OF PLACEMENTS OF 2,4,5-T BASAL SPRAY FOR CONTROL OF BLACKJACK OAK. Weeds 10(1): 74-75. Jan. 1962. WR 105: 13

Summary: The propylene glycol butyl ester of 2,4,5-T in a concentration of 8 lb ahg in diesel oil was applied at approximately 48 ml per inch of stem diameter as a basal spray to blackjack oak trees by five methods. Trees girdled with an ax and no herbicide applied were used as a standard treatment. The data confirm the need for wetting the root collar and sprouting zone when applying 2,4,5-T as a basal spray to blackjack oak. Poor kill of roots was obtained when this distribution was not obtained. Root sprouts produced were vigorous regardless of treatment.

Rodgers, E. G., E. O. Burt, and R. P. Upchurch. (Univ. Fla., Gainesville.) REPLACEMENT OF TURKEY OAK VEGETATION WITH LOW-GROWING SOIL COVER. Weeds 10 (1): 48-53. Jan. 1962. WR 105: 13

Among 15 different herbicides tested for eradication of turkey oak (Quercus laevis Walt.) over a period of four years on Lakeland fine sand in Florida, only monuron, diuron, and fenuron at minimal rates of 10 lb/A were effective. One full growing season after application was required for complete kill. Phenoxy compounds gave variable top-kill but not satisfactory control. AMS, dalapon, and four formulations of benzoic acid were ineffective in these tests. Out of 13 different grasses, Pensacola bahiagrass (Paspalum notatum Flugge) and weeping lovegrass (Eragrostis curvula Schrad.) were best adapted to these deep sandy soils. Seedbed preparation was essential to obtain a good stand of either.--From auth. abstr.

CONTROL OF VEGETATION WITH HERBICIDES ETC.--Continued

Vogel, Willis G., and Elroy J. Peters. (Central States Forest Expt. Sta., Columbia, Mo.) SPRAYING, SEEDING, AND FERTILIZING INCREASE FORAGE ON OZARK FOREST RANGES. Central States Forest Expt. Sta., Sta. Note no. 152. 2 p., 1 fig. Dec. 1961. WR 105: 14

Spraying with 2,4,5-T at a rate of 2 pounds acid equivalent per acre in 4.5 gallons of fuel oil, seeding with introduced or native forage species, and applying commercial fertilizer greatly increased forage production the first year after treatment on Ozark forest ranges (Mo.).

MAMMALS--GENERAL

Whitaker, John O., Jr. (Cornell Univ., Ithaca, N. Y.) ENDOGONE, HYMENOGASTER AND MELANOGASTER AS SMALL MAMMAL FOODS. Am. Midland Nat. 67(1): 152-156. Jan. 1962. WR 105: 14

Endogene [a subterranean fungus] is of great importance to Napaeozapus, Zapus, and Clethrionomys at Ithaca and a common food of Blarina and Sorex fumeus. Hymenogaster was a less important food, and Melanogaster was not reported as a food item in this study.

MAMMALS--POPULATIONS, HOME RANGES, COMMUNITIES

Justice, Keith E. (Ariz.-Sonora Desert Museum, Tucson, Ariz.) A NEW METHOD FOR MEASURING HOME RANGES OF SMALL MAMMALS. J. Mammal. 42(4): 462-470, 2 figs. Nov. 1961. WR 105: 14

Abstract: The movements of individually toe-marked wild Mus musculus were detected by tracking the mice on smoked kymograph paper. The smoked paper was placed in unbaited half-gallon milk-carton or coffee-can shelters arranged in a dense rectangular grid. As many as ten records were obtained from an individual mouse in a single night. The method avoids the biases of trap inhibition, learning, and trap fatigue inherent in the mark-and-recapture method, and provides information suitable for the investigation of the theoretical probability density functions of mouse activity.

MAMMALS--PARASITES AND DISEASES

Bigland, C. H., G. S. Wilton, and H. N. Vance. (Alberta Dept. Agr., Edmonton.) SALMONELLOSIS OF ANIMALS IN ALBERTA, 1949 TO 1960. J. Am. Vet. Med. Assoc. 140(3): 251-253. 1 Feb. 1962. WR 105: 14

Kilham, Lawrence. (Lyme, N. H.) THE OCCURRENCE OF TUMORS IN WILD ANIMALS. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 164-165. 1959 [1961]. WR 105: 14

The 2 tumors (fibromas and papillomas) of cottontails are distinct in their geographical distributions. The papillomas, or "horns", occur in states west of the Mississippi and are found mostly on the heads and necks of afflicted animals. Fibromas, or "warts", are limited to eastern cottontails and are found mostly on the feet and lower legs. Mosquitoes are efficient vectors for the fibroma virus. Fibromas in squirrels and deer are discussed.

Lee, Hong-Fang. LIFE HISTORY AND EPIDEMIOLOGICAL STUDIES OF HETEROBILHARZIA AMERICANA PRICE, 1929, SCHISTOSOME OF THE RACCOON, NUTRIA, DOG AND RABBIT. Ph.D. thesis, Tulane Univ. 198 p. 1961. [From Dissertation Abstr. 22(4), 1961.] WR 105: 14

"Heterobilharzia americana infection was found in 25 of 52 raccoons, 22 of 37 nutrias at Pass à Loutre Wildlife Refuge, Avery Island and Lafitte, and 1 of 3 rabbits and each of 3 dogs at Pass à Loutre in Louisiana."--From abstr.

SHREWS, MOLES, BATS

Ingles, Lloyd G. (Fresno State Coll., Fresno, Calif.) HOME RANGE AND HABITATS OF THE WANDERING SHREW. J. Mammal. 42(4): 455-462, 2 figs., 1 pl. Nov. 1961. WR 105: 15

The minimal home range varied from 260 to 6,758 square feet. Mature shrews have larger home ranges than do immature shrews. There is evidence that the size, shape, and the part of the home range used varies with age and season.--From auth. abstr.

Ross, Anthony. (Univ. Ariz., Tucson.) BIOLOGICAL STUDIES ON BAT ECTOPARASITES OF THE GENUS TRICHOBIUS (DIPTERA: STREBLIDAE) IN NORTH AMERICA, NORTH OF MEXICO. Wasmann J. Biol. 19(2): 229-246. Fall 1961. WR 105: 15

Includes information on collection and preparation of material, distribution, host-parasite relation, and life history of these ectoparasites of bats.

Short, Henry L. (Mich. State Univ., East Lansing.) GROWTH AND DEVELOPMENT OF MEXICAN FREE-TAILED BATS. Southwestern Nat. 6(3-4): 156-163, 3 figs. 29 Dec. 1961. WR 105: 15

Abstract: The growth and development of Mexican free-tailed bats, Tadarida brasiliensis mexicana (Saussure), are described from about 25 days before birth until young bats are indistinguishable from adults. Young bats have gained a grey pelage and an adult-like dentition, forearm length and body weight by six weeks of age, when they first fly from the nursery caves. Upon first flying a loss in the weight of the body and of the adrenals is observed. This weight loss is not regained until young bats are about 11 or 12 weeks of age.

Sluiter, J. W. SEXUAL MATURITY IN MALES OF THE BAT MYOTIS MYOTIS. Proc. Kon. Nederlandse Akad. Weten. (Biol. & Med. Sci.) ser. C., 64(2): 243-249. 1961. [From J. Mammal. 42(4), 1961.] WR 105: 15

Wimsatt, William A., and Anthony Guerriere. (Cornell Univ., Ithaca, N. Y.) CARE AND MAINTENANCE OF THE COMMON VAMPIRE IN CAPTIVITY. J. Mammal. 42(4): 449-455, 1 fig. + 1 pl. Nov. 1961. WR 105: 15

Abstract: Conditions and procedures which have been utilized in our laboratory in the successful maintenance of the common vampire bat, Desmodus rotundus, in captivity over a period of several years are described, with the expectation that they may prove useful to other investigators. Also described is a cage design which helps minimize some of the special problems associated with the handling of vampires and making provision for their sanitation; the cage can also be used to advantage with other species of bats.

RABBITS AND PIKAS

Adams, Lowell, William G. O'Regan, and David J. Dunaway. (Pacific SW Forest & Range Expt. Sta., Berkeley, Calif.) ANALYSIS OF FORAGE CONSUMPTION BY FECAL EXAMINATION. J. Wildl. Mgmt. 26(1): 108-111. Jan. 1962. WR 105: 15

A proposed method of estimating weight of food eaten by snowshoe hares is to estimate the number of recognition items in the feces on an area and convert this number to weight eaten (by a calibration developed with captive hares.) The calibration is obtained by feeding the hares known weights of food and counting the recognition items in the resulting feces. The coefficient of variation of the estimate and the method of computing it are described.--Auth. abstr.

Barkalow, Frederick S., Jr. (N. C. State Coll., Raleigh.) LATITUDE RELATED TO REPRODUCTION IN THE COTTONTAIL RABBIT. J. Wildl. Mgmt. 26(1): 32-37. Jan. 1962. WR 105: 15

Evidence is presented that the number of young produced per litter in Sylvilagus floridanus mallurus is lower in Ala. and Ga. than in N. C. and Va. and lower in N. C. and Va. than in Conn. The weighted means of 74 litter and embryo counts from Ala. and Ga., 36 litter and embryo counts from N. C. and Va., and 24 embryo counts from Conn. were 3.2, 4.6, and 6.2 respectively. The

unweighted means of the monthly means of the above counts were 3.1, 4.2, and 6.9 respectively. Reproductive activity appears to begin earlier in the southern portion of the range of the subspecies than in the northern portion. The data on the cessation of breeding were too limited to establish regional differences.--Author.

Wight, Howard M., and Clinton H. Conaway. (Patuxent Wildl. Res. Center, Laurel, Md.) DETERMINATION OF PREGNANCY RATES OF COTTONTAIL RABBITS. J. Wildl. Mgmt. 26(1): 93-95, 1 fig. Jan. 1962. WR 105: 16

A discussion of the need to histologically identify and include pregnancies in the pre-implantation stages in any computation of pregnancy rates in the cottontail rabbit (Sylvilagus floridanus).--Howard M. Wight.

RODENTS--MISCELLANEOUS

Alvarez, Ticul. SINOPSIS DE LAS ESPECIES MEXICANAS DEL GENERO DIPODOMYS. [SYNOPSIS OF THE MEXICAN SPECIES OF DIPODOMYS.] Rev. Soc. Mexicana Hist. Nat. 21(2): 391-424. Dec. 1960. [From J. Mammal. 42(4), 1961.] WR 105: 16

[In Spanish.]

Bashenina, N. V. [THE ROLE OF THE LIGHT FACTOR IN THE BIOLOGY OF THE FIELD VOLE BASED ON THE STUDY OF MICROTUS ARVALIS PALL.] Bull. Moscow Obshch. Ispit. Prirody (Biol.) 65(5): 16-29. 1960. [From J. Mammal. 42(4), 1961.] WR 105: 16

In Russian with English summary.

Beer, James R., and Charles F. MacLeod. (Biol. Lab., Canada Dept. Agr., Quebec.) SEASONAL REPRODUCTION IN THE MEADOW VOLE. J. Mammal. 42(4): 483-489. Nov. 1961. WR 105: 16

Population structure and reproductive condition of the meadow vole, Microtus pennsylvanicus, were analyzed for the period of July 1954 through July 1955. During this period there was a heavy snow cover throughout the winter and breeding was recorded for every month of the year. In the winters of 1957-58 and 1960-61, when there was very little snow cover, breeding ceased by 17 November and did not resume until about 20 March.--From auth. abstr.

Dunmire, William W. (Hawaii Natl. Park, Hawaii.) BREEDING SEASON OF THREE RODENTS ON WHITE MOUNTAIN, CALIFORNIA. J. Mammal. 42(4): 489-493. Nov. 1961. WR 105: 16

Abstract: Data on breeding condition and sex ratio are presented for Reithrodontomys megalotis, Peromyscus crinitus and Lagurus curtatus at four elevations from 4,500 to 12,400 feet in southern California. In all, 662 "potential adults" were snap-trapped at five periods throughout the year.

McCulloch, Clay Y., Jr. (712 Tyler St., Tempe, Ariz.) AGE CLASSIFICATION AND WEIGHT VARIATIONS OF ORD'S KANGAROO RAT ON THE SOUTHERN GREAT PLAINS. Southwestern Nat. 6(3-4): 149-155. 29 Dec. 1961. WR 105: 16

Ruffer, David G. (Univ. Okla., Norman.) EFFECT OF FLOODING ON A POPULATION OF MICE. J. Mammal. 42(4): 494-502, 2 figs. Nov. 1961. WR 105: 16

"Flooding did not cause enlargement of home ranges [of white-footed mice], but did lead to increased use of the peripheral portions of the established home range and above-ground nesting sites. Flooding did not seem to inhibit movements of the mice within the area nor was it detrimental to their numbers." --From abstr.

White, James Edwin. THE EFFECT OF CONTROL BURNING ON SMALL MAMMAL POPULATIONS OF THE NEW JERSEY PINE BARRENS. Ph.D. thesis, Rutgers Univ. 96 p. [From Dissertation Abstr. 22(5), 1961.] WR 105: 17

Control burned and unburned plots on 2 study areas were live trapped to determine the effects control burning would have on the small mammal populations of the N. J. Pine Barrens. A third study area provided information on the effects of a wild-fire on small mammal populations. There was no association of control burning and population size. The range of intensive activity of Peromyscus leucopus varied inversely with the size of the population. The gross rate of population increase or decrease shows that the variation of population levels among the experimental plots was not due to differential rates of change during the summer months.

SCIURIDS

Baker, Rollin H. (Mich. State Univ., East Lansing.) THE GRAY SQUIRREL--PAST, PRESENT AND FUTURE. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 390-392. 1959 [1961]. WR 105: 17

A review paper. The gray squirrel's present and future status is summarized thus: "(1) The species still occurs in most parts of its pre-settlement range, although its distribution often is discontinuous and spotty; (2) Favored habitat is becoming re-established slowly, especially along streams; (3) The gray squirrel has become resident in groves of nut-bearing shade trees in numerous communities, especially in city parks; (4) If we wish to have more gray squirrels, more long-range programs to manage slow-growing, nut-bearing hardwood forests need to be formulated, keeping in mind that the gray squirrel can be an important wildlife product. In the face of a progressively higher human population in the United States in the years to come, many conservationists may consider that survival, except in token numbers, of the gray squirrel and many other animals and plants may very well depend largely on how compatible these species will be with man's 'inevitable' changes in the landscape."

Bakken, Arnold. (Wis. State Coll., Eau Claire.) BEHAVIOR OF GRAY SQUIRRELS. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 393-407. 1959 [1961]. WR 105: 17

Most aspects of behavior in the gray squirrel are discussed in this paper. The varied calls, signals, postures, and chases are summarized in tables. The chases are analyzed by type (mating, slow ground, short ground, territorial, and spiral tree) and by sex and age for each month of the year. The average home range in acres for juveniles is 5.0 (♂♂) and 3.8 (♀♀); for yearlings this increases to 10.7 for ♂♂ and 7.1 for ♀♀; and this is increased further in adults to 24.1 for ♂♂ and 9.9 for ♀♀.

Clark, Gordon Marston. (Patuxent Wildl. Res. Center, Laurel, Md.) PARASITES OF THE GRAY SQUIRREL. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 368-373. 1959 [1961]. WR 105: 17

Sciurus carolinensis has fewer parasites than most other small or medium-sized mammals native to the U. S. An appended list includes approximately 48 spp. of ectoparasites and 30 spp. of endoparasites reported from the gray squirrel.

Dennett, Dan, and J. B. Kidd. (La. Wild Life & Fisheries Comm., New Orleans.) AN ANALYSIS BY TAG RETURNS OF THREE YEARS CONTROLLED SQUIRREL HUNTING. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 66-73, 3 figs. 1960 [1962]. WR 105: 17

From returns from 413 tagged and released squirrels it is estimated that hunters take approximately 15% of the squirrels on Grant-Rapides Game Mgmt. Area (central La.). In addition to gaining some insight on the effects of hunting pressure, limited information concerning home range, sex ratios, and the rate of tag loss was also obtained. Using information gathered during this study, an attempt to calculate population numbers has been made.--From abstr.

Flyger, Vagn, editor. (Box 1510, Annapolis, Md.) SYMPOSIUM ON THE GRAY SQUIRREL. Md. Dept. Res. & Educ., Contrib. no. 162. i + p. 356-407. [1960.] WR 105: 18

An extract from the Proceedings of the Thirteenth Annual Conference of Southeastern Association of Game and Fish Commissioners. The ten papers and the resulting discussion presented summarize much of the current research on the gray squirrel. The individual papers appear in this section of WR.

Garst, Warren. (Colo. State Univ., Fort Collins.) TECHNIQUE FOR CAPTURING YOUNG PRAIRIE DOGS. J. Wildl. Mgmt. 26(1): 108. Jan. 1962. WR 105: 18

Young black-tailed prairie dogs (Cynomys ludovicianus) were captured soon after their first appearance above ground by collapsing their burrows with a weak charge of dynamite.--Author.

Kilham, Lawrence. (Lyme, N. H.) VIRUS TUMORS OF GRAY SQUIRRELS. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 374. 1959 [1961]. WR 105: 18

Domestic rabbits and juvenal woodchucks are the only mammals susceptible to squirrel fibroma virus. Squirrel fibromas can be transmitted readily by mosquitoes. Fibromas are ideal tumors for insect transmission. The role of other arthropods (possibly ones living in squirrel nests) as reservoirs of infection is postulated.

Moore, J. C. THE RELATIONSHIPS OF THE GRAY SQUIRREL, SCIURUS CAROLINENSIS, TO ITS NEAREST RELATIVES. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 356-363. 1959 [1961]. WR 105: 18

The nearest relative is Sciurus oculatus alleni and the separation of these two forms can be explained adequately by either of two hypotheses.

Moore, Joseph Curtis. GEOGRAPHIC VARIATION IN SOME REPRODUCTIVE CHARACTERISTICS OF DIURNAL SQUIRRELS. Am. Museum Nat. Hist. 122(1). 32 p. 3 Apr. 1961. $1.00. WR 105: 18

The discovery of a third line of evidence (number of pairs of functional mammae) is reported which separates the large tribe of Oriental tree squirrels (Callosciurini) from the Holarctic members of the tribe Sciurini. The evidence also associates the widely disjunct Bornean tassel-eared squirrel Reithrosciurus with the Holarctic Sciurini. In addition to being of systematic value in its geographical variation, the number of pairs of functional mammae is shown to vary with latitude. The number of pairs generally decreases from boreal and temperate climates to tropical.--From auth. summ.

Sharp, Ward M. (Pa. Coop. Wildl. Res. Unit, University Park.) A COMMENTARY ON THE BEHAVIOR OF FREE-RUNNING GRAY SQUIRRELS. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 382-387. 1959 [1961]. WR 105: 18

In this paper 5 different categories of calls are recognized for the gray squirrel and these are related to behavior. Other aspects of behavior discussed are: behavior in years of food scarcity and abundance, territoriality and gregariousness, hibernation, feeding habits, the practical use of gray squirrel behavior mannerisms in its management, and the influence of behavior mannerisms on population levels.

Shorten, Monica. SQUIRRELS IN BRITAIN. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 375-378. 1959 [1961]. WR 105: 18

The history of squirrels (the native red squirrel, Sciurus vulgaris leucourus, and the introduced gray squirrel, Sciurus carolinensis) is reviewed, and their habits compared. The introduced gray squirrel causes considerable damage to trees by removing bark and cambium of young hardwood trees principally Acer pseudoplatanus and Fagus sylvatica. Gray squirrel control by shooting is not as effective as trapping. Poisoning of squirrels is illegal in Britain.

SCIURIDS--Continued

Shorten, Monica. DAMAGE CAUSED BY THE GRAY SQUIRREL IN BRITAIN. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 378-381. 1959 [1961]. WR 105: 19

In addition to attacking the crowns of Acer pseudoplatanus and the butts of Fagus sylvatica, gray squirrels damage the upper stem of oak, birch, ash, chestnut, larch and Pinus sylvestris and the tops of poplar, hornbeam and Norway maple. The most susceptible age class for trees likely to be damaged by gray squirrels is 20-30 years. In this age class, oak was damaged in 26% of the forests, and Acer pseudoplatanus was attacked in 81% of the forests. Damage occurs during April-July and coincides with red squirrel stripping of bark from Pinus sylvestris. The condition of the sap and the relative scarcity of the food are believed to be factors influencing this behavior.

Uhlig, Hans G. (SCS, Fergus Falls, Minn.) SQUIRREL MANAGEMENT AND RESEARCH. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 387-389. 1959 [1961]. WR 105: 19

"We have now sufficient knowledge to manage squirrels within reasonable limits, provided we are willing to search the literature, apply what we know, and then possibly set up research projects to determine the outcome in terms of population manipulation.... Squirrel research that will eventually lead toward practical management must be practical itself. We need a good and practical censusing technique to aid us in many phases of research concerning management. Other than this I would limit research by state game departments, for the most part, to squirrel food and cover requirements or management. For when these factors are met, all other factors, such as the effect of hunting, predators, and weather will fall in their proper places."

Wirtz, John Harold. THE GOLDEN-MANTLED GROUND SQUIRREL, CITELLUS LATERALIS CHRYSODEIRUS (MERRIAM), ITS SOCIAL AND COMMUNITY INTERACTIONS. Ph.D. thesis, Oreg. State Univ. 144 p. 1961. [From Dissertation Abstr. 22(4), 1961.] WR 105: 19

BEAVER

Berghofer, Carl B. (N. Mex. Dept. Game & Fish, Embudo.) A NEW LIVE TRAP FOR BEAVER. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 177-181. 1960 [1961]. WR 105: 19

Details are given on the construction and operation of an inexpensive, simply constructed, compact light-weight collapsible live trap for beaver. These traps costing about $5.20 apiece are preferred to both the Bailey and the Hancock traps in N. Mex.

Berghofer, Carl B. (N. Mex. Dept. Game & Fish, Embudo.) MOVEMENT OF BEAVER. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 181-184. 1961 [1962]. WR 105: 19

Between 1945 and 1960, releases of 397 ear-tagged beaver were made in New Mexico. Twenty-seven of these were subsequently retrapped. The greatest distance from the release site of any retrapped beaver was 32 miles. The average distances traveled overland and downstream were 14 and 6 miles respectively. The average distance traveled downstream by ♂♂ was 8 while ♀♀ averaged 6. The average distance traveled overland was 16 and 9 for ♂♂ and ♀♀ respectively. Approximately 55% of the retrapped beaver had moved overland. The above data indicate that adult beaver are more inclined to travel in search of new habitat than are the young. Males may be expected to travel farther than ♀♀. Beaver moving overland may travel farther than those going downstream in spite of the convenience downstream travel affords. --From summ.

Brenner, Fred J. (Pa. State Univ., Univ. Park.) FOODS CONSUMED BY BEAVERS IN CRAWFORD COUNTY, PENNSYLVANIA. J. Wildl. Mgmt. 26(1): 104-107. Jan. 1962. WR 105: 20

Three beaver colonies utilized 34.2% quaking aspen (Populus tremuloides) and 18.2% red maple (Acer rubrum) available. An individual beaver's daily food consumption was 23.4 oz of woody vegetation. Waste amounted to 1.03 oz of food per beaver daily. Herbaceous vegetation was utilized for food during the spring and summer. One acre of aspen would produce an average of 5,840 lb of food and would support 10 beavers for one year provided a high degree of waste does not occur and herbaceous material is utilized during the spring and summer months.--Author.

Lavrov, L. S. [THE STATE OF AN ABORIGINAL BEAVER COLONY IN THE UPPER PART OF THE YENISEI RIVER AND THE TASKS OF ITS PRESERVATION.] Bull. Moscow Obshch. Ispit. Prirody (Biol.) 65(5): 35-39. 1960. [From J. Mammal. 42(4), 1961.] WR 105: 20

In Russian with English summary.

Provost, Ernest E. (Univ. Ga., Athens.) OVARIAN ANALYSIS AS A TECHNIQUE FOR STUDYING REPRODUCTION IN BEAVER. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 35-36. 1960 [1962]. WR 105: 20

The use of corpora lutea and corpora albicantia count techniques in beaver studies.

Rukovsky, N. N., and N. I. Formicheva. [ON THE RELATIONSHIP BETWEEN THE RIVER BEAVER AND THE OTTER.] Bull. Moscow Obshch. Ispit. Prirody (Biol.) 65 (5): 102-105. 1960. [From J. Mammal. 42(4), 1961.] WR 105: 20

In Russian.

Zharkov, I. V. [THE USE OF THE AIRPLANE FOR THE NUMERICAL ESTIMATION OF BEAVER COLONIES.] Bull. Moscow Obshch. Ispit. Prirody (Biol.) 65(5): 30-34. 1960. [From J. Mammal. 42(4), 1961.] WR 105: 20

In Russian with English summary.

FUR ANIMALS, GENERAL

Byrnes, Myrtis L., and Julius G. Schnitzer. THE FUR INDUSTRY ABROAD. Business & Defense Services Administration, U. S. Dept. Commerce. p. 1-28. June 1959. Available at 25¢ from Supt. Documents. WR 105: 20

"This survey covers the production, consumption, and international trade of the 17 principal foreign fur producing and consuming countries. It was based on a wide range of sources, both official and unofficial."

Clark, Lawrence G., Joseph I. Kresse, Robert R. Marshak, and Charles J. Hollister. (Univ. Pa., Kennett Square.) NATURAL OCCURRENCE OF LEPTOSPIRA ICTEROHEMORRHAGIAE INFECTION IN THE COMMON MUSKRAT (ONDATRA ZIBETHICUS). A PRELIMINARY REPORT. Cornell Vet. 52(1): 3-5. Jan. 1962. WR 105: 20

MUSTELIDS

Kebbe, Chester E. (Oreg. State Game Comm.) TRANSPLANTING FISHER. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 165-167. 1961 [1962]. WR 105: 20

Objectives, procedures, and details of transporting and transplanting 11 fisher (5♂♂ : 6♀♀) from British Columbia to Oreg. in 1961 are outlined.

Murie, Adolph. (Crater Lake Natl. Park, Medford, Oreg.) SOME FOOD HABITS OF THE MARTEN. J. Mammal. 42(4): 516-521. Nov. 1961. WR 105: 21

Abstract: From an analysis of scats, the food habits of the marten were obtained in 3 habitats in Grand Teton National Park. Haw, Oregon grape, blueberry and rhamnus berries were important vegetable food items where available. Voles were the most prominent meat item in the diet. The red squirrel was rarely eaten, but its home was often used for lodging.

Weckwerth, Richard P., and Vernon D. Hawley. (Mont. Fish & Game Dept., Helena.) MARTEN FOOD HABITS AND POPULATION FLUCTUATIONS IN MONTANA. J. Wildl. Mgmt. 26(1): 55-74, 6 figs. Jan. 1962. WR 105: 21

Marten (Martes americana) were live-trapped to obtain population data on a 6 square mile study area in Glacier National Park from 1952 through 1957. Seven small mammal traplines were operated in spring and fall to obtain indices of abundance of marten prey species. Analysis of 1758 marten scats showed major foods of marten to be: mammals (93.3%), birds (12.0%), insects (19.0%), and fruits (29.2%). Microtus spp. and Clethrionomys gapperi were the major mammalian food items. Marten foods appeared to be taken in proportion to their relative abundance except when use of a food was affected by availability, preference by marten, or availability and consumption of other foods. Marten numbers declined from a high in 1952 to a low in early spring 1957, and began to recover in the summer of 1957. The decline in the marten population closely followed a decrease in small mammal density in 1954, which remained low through 1956. Loss of female marten, lowered reproductive success, and failure of juvenile marten to remain on the area were indications of an over population caused in part by food shortage which lowered the carrying capacity of the area. Small mammal population density increased in 1957, raised the carrying capacity, and marten numbers increased.--Auth. abstr.

Wilson, Kenneth A. (N. C. Wildl. Resources Comm., Raleigh.) THE OTTER IN NORTH CAROLINA. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 267-277, 1 fig. 1959 [1961]. WR 105: 21

Results of a long-range study (1947-1959). Information collected during 12 winters on distribution and habitat, food habits, breeding, gestation period, litter size, sex ratios, weights and measurements, population densities and range, movements, harvest, yields, fur values, and management for the otter in N. C. is summarized.

DOGS, WOLVES, FOXES

Lauckhart, J. Burton. (Wash. Dept. Game, Olympia.) PREDATOR MANAGEMENT. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 85-88. 1961 [1962]. WR 105: 21

A critical analysis of the entire predator picture indicates that there is nothing to cause great concern. With no control, the predators still will not destroy the game populations and, on the other hand, the most intensive control will not upset the wildlife economy. In general, predator control should be flexible, so that control efforts can be confined to areas where studies indicate a problem may exist.--From concl.

Luzhkov, A. D. [STUDIES ON HELMINTHS OF THE WHITE ARCTIC FOX OF THE YAMAL PENINSULA. Trudy Nauk Issled Inst. Sel'sk. Krain. Severa. 8: 52-54. 1960. [From Biol. Abstr. 36(22), 1961, from Referat. Zhur., Biol., 1961, no. 5E81.] WR 105: 21

Translation [from Russian]. All 14 specimens examined were found to be infected with helminths. Most frequently found were Toxascaris leonina and Taenia hyperborea. Spirocerca lupi was found in Arctic fox for the first time.

Pimlott, Douglas H. (Ontario Dept. Lands & Forests, Maple.) WOLF CONTROL IN CANADA. Canadian Audubon 23(5): 145-152, illus. Nov.-Dec. 1961. WR 105: 22
A history and status report of the wolf management programs in the Canadian provinces.

Robinson, Weldon B. (Denver Wildl. Res. Center, Denver, Colo.) POPULATION CHANGES OF CARNIVORES IN SOME COYOTE-CONTROL AREAS. J. Mammal. 42(4): 510-515. Nov. 1961. WR 105: 22
Based on records of predator-control operations of 1940-41, 1951, and 1960 in 7 localities in N. Mex., Colo., and Wyo. In 4 areas in Colo. and N. Mex., coyote numbers declined from 1940-1 to 1951, then increased in 1960. The population trends of bobcats, skunks and raccoons were generally in the reverse direction, with the largest catches in 1951. Badgers and swift foxes continued to increase over the 20-year period. In the 3 Wyo. areas, the coyote population dropped in 1960 to 8% of its 1940-1 level while numbers of the other carnivores increased sharply. More than 25 times as many bobcats, 3 times as many skunks, and 8 times as many badgers were caught in this state in 1960 as 20 years ago; 9 raccoons also were trapped in 1960 where none was taken in 1940-1. There were changes in the population levels of coyotes and of some or all of the other carnivores during each of the 10-year periods in each of the three states. The causes of the changes in the numbers of other carnivores are obscure, but it is evident in each case that the level of coyote control which was applied did not hold down the populations of these other animals.--From auth. abstr.

Villa R., Bernardo. COMBATE CONTRA LOS COYOTES Y LOS LOBOS EN EL NORTE DE MEXICO. [COMPETITION BETWEEN COYOTES AND WOLVES IN NORTHERN MEXICO.] Ann. Inst. Biol., Univ. Mexico, 31(1-2): 463-499. 1960. [From J. Mammal. 42 (4), 1961.] WR 105: 22
[In Spanish.]

BIG GAME, GENERAL

Banfield, A. W. F. (Natl. Museum Canada, Ottawa, Ont.) A REVISION OF THE REINDEER AND CARIBOU, GENUS RANGIFER. Natl. Museum Canada, Bull. no. 177, Biol. Ser. no. 66. vi + 137 p., 14 figs., 12 pls. 1961. WR 105: 22
With Russian summary. Six forms of tundra reindeer and 3 forms of woodland caribou are recognized. All are forms of Rangifer tarandus. Future evolutionary trends are predicted.

Brooks, Allan C., and Irven O. Buss. (Game & Fisheries Dept., Entebbe, Uganda.) PAST AND PRESENT STATUS OF THE ELEPHANT IN UGANDA. J. Wildl. Mgmt. 26(1): 38-50, 3 figs. Jan. 1962. WR 105: 22
During 1926-58, the average annual kill of elephants in Uganda was 1,235 animals. When data based on distribution and migration of elephants in Uganda were plotted graphically they show that in 1929 approximately 70% of all the land in Uganda was occupied by elephants, but 30 years later only about 17% was occupied. The 1929 distribution of elephants was effected significantly by changing or arresting migrations. Some of the smaller populations became entirely isolated from major populations, and in some areas elephants were completely extirpated. These drastic changes in distribution and migration are attributable to the great increase in human population. As natives spread into occupied elephant ranges, crop depredations and hazards to human activities became inevitable. Consequently, the authors are forced to conclude that today's diminished ranges are still shrinking, and the best hope for preserving this large member of the unique Ethiopian fauna appears to be by managing it within the National Parks and other reserves of Uganda and elsewhere in Africa. --From auth. abstr.

Crump, William I. (Wyo. Game & Fish Comm., Lander.) AERIAL MARKING OF ANTELOPE FOR MIGRATION AND DISTRIBUTION STUDIES. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 93-98. 1961 [1962]. WR 105: 23

Techniques were devised for the aerial application of a dye solution (Nyanzol "D" black powder) to mark antelope in Wyo. This dye marked the hair of animals with a black coloration that could be identified by aerial or ground observations. Several significant herd movements and seasonal distribution patterns have been determined through use of this technique. It is suggested that this technique is more practical and economical than live-trapping for marking or fawn-marking operations.--From summ.

Dasmann, Raymond F., and Archie S. Mossman. (Univ. Calif., Berkeley.) ROAD STRIP COUNTS FOR ESTIMATING NUMBERS OF AFRICAN UNGULATES. J. Wildl. Mgmt. 26(1): 101-104. Jan. 1962. WR 105: 23

Road strip counts were tested in Livingstone Game Park, Northern Rhodesia, for censusing known populations of various species of African ungulates. For the smaller or more wary species, populations were greatly underestimated. For the larger more conspicuous species, populations were underestimated also when mean sight distances were used to determine strip widths. The use of other methods for determining strip width would improve the technique. It is concluded that road strip counts are useful for more easily detected species if the purpose is to establish a safe minimum estimate of population size as a base from which to start management.--R. F. Dasmann.

Dietz, Donald R., and Lee E. Yeager. (Colo. Coop. Wildl. Res. Unit, Ft. Collins.) THE APPARENT ROLE OF SAGEBRUSH IN THE MANAGEMENT OF MULE DEER WINTER RANGE. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 151-158. 1959 [1960]. WR 105: 23

Big sagebrush may well hold the key to the size of deer herds in the future. If sagebrush lands are indiscriminately destroyed, then this particular wildlife resource will probably never again attain the importance it has attained during the last 2 or 3 decades.

Dow, Sumner A., Jr., and Philip L. Wright. (Tenn. Game & Fish Comm., Nashville.) CHANGES IN MANDIBULAR DENTITION ASSOCIATED WITH AGE IN PRONGHORN ANTELOPE. J. Wildl. Mgmt. 26(1): 1-18, 4 figs. Jan. 1962. WR 105: 23

Twenty known-age and established age pronghorns, which were allowed to range freely on the National Bison Range, Moiese, Mont., were shot at ages between 44 days and 6-1/3 years. The mandibular dentition for each of these animals is described and in most cases illustrated. Fawns, yearlings, and 2-year-olds can be recognized by stages in tooth succession. The older age classes are identified by gradual loss of infundibula from the molariform teeth. A sample of 1300 jaws from animals taken during 1951 by Mont. hunters was studied and compared with the known-age series. The assignment of age classes to the sample resulted in a distribution which generally fitted the assumption that Mont. antelope were increasing at a constant rate prior to the 1951 season. The 6-plus age class is present in greater numbers than would be expected. More known-age jaws are needed in the older age classes to determine the extent of variation.--From abstr. by P. L. Wright.

Harn, Joseph H. (U. S. Forest Service, Placerville, Calif.) NATALITY AND MORTALITY OF ROOSEVELT ELK IN NORTHERN CALIFORNIA. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 220-223. 1960 [1961]. WR 105: 23

During 1957 and 1958 both calf natality and calf mortality were high. Malnutrition and poaching were the 2 most important factors in elk loss. Of 107 known elk deaths, malnutrition accounted for 19.6% and illegal kill for 17.8% of the total. Mature ♀♀ were affected most by all factors combined, with calves and mature ♂♂ also highly affected. It is concluded that habitat improvement and reduction of elk on overstocked areas are essential measures needed to insure the perpetuation of a healthy elk population in northern Calif.--From summ.

Harper, James A. (Humboldt State College, Arcata, Calif.) DAYTIME FEEDING HABITS OF ROOSEVELT ELK ON BOYES PRAIRIE, CALIFORNIA. J. Wildl. Mgmt. 26(1): 97-100. Jan. 1962. WR 105: 24

Orchard grass, sweet vernal grass, and redtop were the leading forage species occurring in 4,795 elk-minutes recorded on Boyes Prairie. In general, grasses dominated the herd's diet with browse plants second and forbs third in importance. Species were not necessarily consumed in relation to their availability in the plant cover.--Author.

Harris, John T. (Colo. Game & Fish Dept., Boulder.) TOTAL MULE DEER POPULATION ESTIMATES FROM PELLET COUNTS. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 237-247. 1959 [1960]. WR 105: 24

Summary: Total population estimates using the pellet-count technique were found to be generally conservative. There are a number of variables associated with population estimates from the pellet-group data. All of them need to be appraised and weighted accordingly if any degree of accuracy is to be obtained. Proper appraisal of these factors requires factual information of a nature that would, for the most part, be beyond the scope of any practical management program. The method does show promise, however, and would be of greatest use on areas being studied intensively. The pellet-count technique probably has its greatest value, from a management standpoint, in determining population trends, concentration areas, and comparison with range-use information. The data lend themselves well to statistical analysis if the sample is properly applied. Consequently, it is possible to place a measure of confidence on statements concerning the population under study.

Hart, J. S., O. Heroux, W. H. Cottle, and C. A. Mills. (Natl. Res. Council, Ottawa, Canada.) THE INFLUENCE OF CLIMATE ON METABOLIC AND THERMAL RESPONSES OF INFANT CARIBOU. Canadian J. Zool. 39(6): 845-856, 4 figs. Dec. 1961. WR 105: 24

Field and laboratory study. "The metabolic rate was doubled by a lowering of temperature to about 0°C, but cold combined with wind and precipitation elevated the metabolic rate to over five times the resting value.... The possibilities for prediction of mortality from wind chill values and estimated fur heat loss are discussed."--From auth. abstr.

Hatter, J., and P. W. Martin. (British Columbia Fish & Game Branch, Vancouver.) MANAGEMENT OF MOOSE IN BRITISH COLUMBIA. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 205-210. 1960 [1961]. WR 105: 24

Annual moose harvest, range evaluation methods, pellet group indices, aircraft census, and sex and age composition of the moose harvest for the period 1954-1959 are discussed and from this an 8-point summary of objectives and conclusions for a moose management program in British Columbia is derived.

Hinman, Robert A. (Utah Dept. Fish & Game, Ogden.) PROBLEMS IN ANTELOPE MANAGEMENT IN UTAH. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 201-207. 1959 [1960]. WR 105: 24

Neither eagle predation nor other forms of mortality were important in the population dynamics of the antelope herd during 1956-8. It should be noted, however, that the study coincided with a period of average or above average precipitation and resulting improved range conditions after about five years of drought. It is believed that the desert areas of Utah are marginal antelope range, especially in their present over-grazed condition, and that the forage may be of too poor quality in drought years to support a healthy pronghorn herd, thus limiting fawn survival. The period of study also coincided with an upswing in jackrabbit populations, and this may have considerable bearing in the severity of predation pressure exerted on the antelope by golden eagles.--From summ.

Hunter, Gilbert N. (Colo. Dept. Game & Fish, Denver.) MANAGEMENT VALUES OF COLORADO'S ELK VALIDATION SYSTEM. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 209-212 + 1 unpaged table. 1959 [1960]. WR 105: 25

"The elk validation system, as employed in Colorado, means that a hunter can obtain--in addition to the regular license which entitles him to take antlered elk only--a special validation permit [obtained at an annual drawing], allowing him to take an elk of his choice." The proper management of elk in Colo. is best achieved by the elk validation system.

Kolenosky, George Ben, and Richard S. Miller. (Univ. Sask., Saskatoon.) GROWTH OF THE LENS OF THE PRONGHORN ANTELOPE. J. Wildl. Mgmt. 26(1): 112-113, 2 figs. Jan. 1962. WR 105: 25

A study of the rate of lens growth in the pronghorn antelope (Antilocapra americana) showed a period of extremely rapid growth with a straight line relationship between lens weight and age from 3 months after conception to 5 months after birth; a negative acceleration phase from 5 months to 3.5 years, and a steady but slower rate of growth from 3.5 years to death. A straight line relationship between lens weight and age from the ages of 5 months to 9.5 years is obtained by applying Huxley's differential growth equation of $y = bx^k$ when $b = 237.1$ and $k = 0.275$, where M = age in months and W = lens weight in milligrams.--Auth. abstr.

Mohler, Levi L. (Idaho Fish & Game Dept., Boise.) HOW BIG GAME REPORT CARDS CONTRIBUTE TO BETTER GAME MANAGEMENT IN IDAHO. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 219-221. 1959 [1960]. WR 105: 24

Big game report cards are used to obtain information on daily, weekly, and seasonal legal kill by counties, hunter success, and the sex ratio of the reported kill.

Ogren, Herman A. (N. Mex. Dept. Game & Fish, Santa Fe.) BARBARY SHEEP--AMERICA'S NEW BIG GAME ANIMAL. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 249-252. 1959 [1960]. WR 105: 25

The initial stockings of Barbary sheep in N. Mex. were made in the late 1940's. In 1955, Barbary sheep were declared to be a game animal and the legal harvest for the period 1955-9 in N. Mex. totalled 78. Research initiated in 1955 has supplied information on food habits, breeding biology, parasites and disease, age composition, and population of the Barbary sheep. Aerial census, direct count on horseback, track counts, and wallow counts have not been successful. Barbary sheep have the same defecation rate as mule deer but distinguishing the pellets is "still more of an art than a science." Some work on pellet-group counts has been initiated.

Post, George. (Utah Dept. Fish & Game, Salt Lake City, Utah.) PASTEURELLOSIS OF ROCKY MOUNTAIN BIGHORN SHEEP (OVIS CANADENSIS CANADENSIS). Wildl. Disease no. 23. 14 p. Jan. 1962. WR 105: 25

[Numbers 22 and 23 on one microcard.] A search for Pasteurella or Pasteurella-like bacteria from Rocky Mountain bighorn sheep yielded five strains or species from apparently normal animals and five strains or species from dead or diseased bighorn sheep. Morphology, staining and biochemical characteristics of the ten organisms and four types of Pasteurella multocida and one type of Pasteurella hemolytica from domestic animals were compared. Two outbreaks of pasteurellosis in bighorn sheep were studied. Circumstances surrounding these outbreaks indicate pasteurellosis may have been responsible for some of the losses which have occurred in bighorn sheep during the last half century.--From abstr.

Shaw, Wesley M. (Idaho Fish & Game Dept., Boise.) RESUME OF IDAHO'S BIG GAME SALTING. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 197-200. 1959 [1960]. WR 105: 25

"The first salting efforts from 1,000 lbs. in the 1913-14 period increased, and by 1934 the distribution of salt for big game reached 100 tons, peaking in 1946 at 235 tons and declining to 4.25 tons in 1959."

Smith, Ronald H. (Ariz. Game & Fish Dept., Tempe.) A HUNTER QUESTIONNAIRE FOR COMPILING HUNT STATISTICS. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 213-218. 1959 [1960]. WR 105: 26

Summary: The Ariz. Game and Fish Dept. has effectively replaced a hunter report card system by a mail questionnaire for compilation of big game statistics. A high per cent of return has been achieved on each questionnaire. It is believed that this high return is due mainly to (1) the simplicity of the questionnaire card, (2) contacting the hunter immediately following the hunt, and (3) using a separate questionnaire card for each species. Analysis of returns shows that there is a larger per cent of non-participants and unsuccessful hunters among the late respondents. It is, therefore, necessary to achieve a high per cent return to avoid inflating harvest estimates. Where returns using one follow-up are less than 75% of the original mailing list, two follow-ups should be used. No significant difference was found between hunter success of respondents and non-respondents. Where questionnaire returns are high, the error in harvest estimates introduced by assuming no bias among non-respondents is negligible.

Sparks, Earl A. (Utah Dept. Fish & Game, Sandy.) STATUS OF MOOSE IN UTAH. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 253-255. 1959 [1960]. WR 105: 26

An aerial survey (Feb. 1959) showed 74 moose, of which 19 were bulls, 36 cows, and 19 calves. This represents an increase of 15 animals over the previous high count and an extension of the range.

Straley, James H. (Wyo. Game & Fish Comm., Pinedale.) TECHNIQUES OF TRAPPING AND MARKING ELK. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 217-219. 1960 [1961]. WR 105: 26

Details of trapping, handling, and neck-banding of elk in northwestern Wyoming and Yellowstone National Park in 1959 and 1960.

Straley, James H. (Wyo. Game & Fish Comm., Pinedale.) MOOSE MANAGEMENT IN WYOMING. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 99-102. 1961 [1962]. WR 105: 26

In the past twenty-one years Wyo. has harvested 7595 moose, and of this amount, more than one-half have been taken in the past six years. The illegal kill during this time would probably raise this total kill another 2000 animals. A factor that would be helpful in our overall moose management program would be to omit the word "mature" from the hunting orders and allow calves to be taken. Hunter controllability through the use of smaller hunting areas and area boundaries will probably be essential to distribute the hunter kill within areas. It is not economically feasible, under present management conditions, to determine moose density, either by range analysis methods or census. Population indices, such as hunter success, average number of moose seen per hunter, and the harvest composition, are provided by kill data from the hunter questionnaire.--Auth. concl.

Vysotskii, B. V., and L. P. Ryashchenko. [LEPTOSPIROSIS IN SPOTTED DEER, CERVUS NIPPON.] J. Microbiol. (Moscow) no. 5. p. 67-68. 1961. [From Vet. Bull. 32(1), 1962.] WR 105: 26

In Russian with English summary. An attempt is being made to domesticate these deer in the Primorsk region. Blood samples from 450 were examined and 8.4% reacted to L. pomona antigen, 5.1% to L. tarrasowi, and 1% to L. saxkoebing.--R.M.

Walker, Ronald L. (Hawaii Div. Fish & Game.) THE HYBRIDIZATION OF THE MOUFLON WITH THE HAWAIIAN FERAL SHEEP AS A MANAGEMENT TECHNIQUE. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 148-156. 1960 [1961]. WR 105: 27

A four-phase (experimental, pilot, intermediate, and final) program of hybridization of mouflon and feral sheep in Hawaii is described. The experimental phase can be considered conclusive. At present 10 mature F-1 Mouflon-feral hybrids (4♂♂ : 6♀♀) have been bred in captivity. With a completion of this phase the next step will be to replace a large population of feral sheep with a smaller number of hybrids. This will be accomplished by gradually building up a population of hybrids in captivity, eliminating all feral sheep through public hunting, and finally releasing new stock. It is projected that hybridization as a management technique is even more adaptable to game bird management.

Wright, Philip L., and Sumner A. Dow, Jr. (Mont. State Univ., Missoula.) MINIMUM BREEDING AGE IN PRONGHORN ANTELOPE. J. Wildl. Mgmt. 26(1): 100-101. Jan. 1962. WR 105: 27

From a herd of free-ranging pronghorn antelope maintained on the National Bison Range, Moiese, Montana used for aging technique studies, one female produced twin fawns at the age of one year rather than the usual age of 2 years. During one breeding season the only male antelope on the range were 1-1/3 years old or younger. The following spring several does, impregnated by these yearling bucks, produced fawns.--P. L. Wright.

Yoakum, Jim. (P. O. Box 128, Ely, Nevada.) 1960 TRANSACTIONS / INTERSTATE ANTELOPE CONFERENCE. 136 p., illus. 1960. $1.00, available from Jim Yoakum. WR 105: 27

This volume is more than twice the size of the first mimeographed report of the Interstate Antelope Conference of 1958. Agency reports and contributed papers are: Hart Mountain National Antelope Refuge Summary, John Novak and O. V. Deming; Sheldon National Antelope Refuge and Range Summary 1954-1960, L. W. Worden and O. V. Deming; Antelope in California, James H. Gilman; Nevada Antelope Studies, Progress Report, William W. Forse; Oregon Antelope Report, 1960, Ira D. Luman; Notes on Idaho Antelope Management Data, W. M. Shaw; The History of the Antelope Introduction on Lanai Island, Hawaii, Lyman Nichols; Regulation of Numbers of Pronghorn Antelope in Relation to Land Use, Helmut K. Buechner; Multiple Use and Wildlife, J. C. Windle; and Antelope "Cycles", O. V. Deming.

DEER (Odocoileus)

Baker, Maurice F., Gloria J. Dills, and Frank A. Hayes. (Auburn Univ., Auburn, Ala.) FURTHER EXPERIMENTAL STUDIES ON BRUCELLOSIS IN WHITE-TAILED DEER. J. Wildl. Mgmt. 26(1): 27-31. Jan. 1962. WR 105: 27

Two female Dama virginianus (Cervidae) were inoculated with strain 2308 of Brucella abortus (Parvobacteriaceae). Two other does and the breeding buck were not inoculated. Both infected does developed a titer of 1 : 100 within 42 days post-inoculation, but each reacted differently in fawn production. Neither produced a viable fawn following a gestation period during which the titer was 1 : 200 during any part of the gestation. Attempts to culture B. abortus from the non-viable fawns and one of the infected does were unsuccessful. Neither the control does nor the breeding buck developed significant titers.--M. F. Baker.

Blankenship, Lytle H., and Arnold B. Erickson. COSTS AND VALUES OF MINNESOTA DEER. Conserv. Volunteer 25(144): 46-48. Nov.-Dec. 1961. WR 105: 27

Figures on how Minn. deer hunters in 1959 processed their deer carcasses and how they used the deer hides. About two-thirds of the deer were processed by the hunters. Although 15-20% of the hides were not used, about half of the hides were sold by the hunters. Nearly a third of the successful hunters had their deer hides tanned. Cost for processing carcasses amounted to $430,251 in 1959. Hides tanned cost $127,004 and hides sales totalled $55,938.

Cowan, I. McT., and Valerius Geist. (Univ. British Columbia, Vancouver.) AGGRESSIVE BEHAVIOR IN DEER OF THE GENUS ODOCOILEUS. J. Mammal. 42(4): 522-526, 3 figs. Nov. 1961. WR 105: 28

Abstract: The aggressive behavior of three races of Odocoileus hemionus is described. Five separate elements are identified: crouch, nose licking, circling, snort, and rush. All of these are common to the three races but differences in detail are noted. The "snort" shows greatest diversity between races. Comparisons are drawn between the aggressive behavior of Odocoileus and certain other ungulates.

Egan, Joseph L. (Mont. Fish & Game Dept., Miles City.) SOME RELATIONSHIPS BETWEEN MULE DEER AND ALFALFA PRODUCTION IN POWDER RIVER COUNTY, MONTANA. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 232-240. 1960 [1961]. WR 105: 28

An overlapping of winter and summer ranges is indicated. Timbered areas are used by mule deer primarily during Jan.-Mar., with an increase in use of prairie and creek bottom areas during Apr.-June. This corresponded to the increased use of alfalfa fields in the spring. Peak use of alfalfa fields occurred during late Aug.-early Sept. Except in two instances, no significant difference in alfalfa production existed between the exclosures and their controls in this 3-year study. Correlation coefficients between average number of pods per plant and pellet groups showed a moderate degree of association in 1956 and no association between pellet groups and the air-dry and seed weights in 1957. Small fields seemed "homogenous" as regards pod counts and large fields apparently have no such pod distribution. Pellet groups displayed a somewhat erratic distribution.--From summ.

Hamilton, Rex. (Ind. Dept. Conserv., Indianapolis.) AN EXPANSIBLE COLLAR FOR MALE WHITE-TAILED DEER. J. Wildl. Mgmt. 26(1): 114-115, 1 fig. Jan. 1962. WR 105: 28

This collar is useful for marking adult male white-tailed deer (Odocoileus virginianus), but it is likely to be lost from fawns. It will expand from 18 to 30 inches in circumference to accomodate swelling of the neck during the rut. The collar was retained by adults for up to 24 months. A detailed working drawing is included.--Author.

Hamilton, Rex. (Ind. Dept. Conserv., Indianapolis.) FACTORS AFFECTING DISPERSAL OF DEER RELEASED IN INDIANA. J. Wildl. Mgmt. 26(1): 79-85, 6 figs. Jan. 1962. WR 105: 28

Transplanted white-tailed deer (Odocoileus virginianus) were marked and released to determine effect of homing tendency and age of animals on movements. Movements were not greatly affected by proximity of capture to release site. Adults appeared more likely to leave release sites than did fawns. Adults moved an average distance of 15 miles; fawns 6 miles. Fawns are superior for restocking. Some homing occurred, but the degree of homing was not sufficient to warrant consideration in the choice of release sites for restocking programs.--Author.

Harlow, Richard F., and Edwin L. Tyson. (Fla. Game & Fresh Water Fish Comm., Tallahassee.) A PRELIMINARY REPORT ON THE EFFECT OF MAST ABUNDANCE ON THE WEIGHT AND REPRODUCTION OF DEER IN CENTRAL FLORIDA. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 62-69, 1 fig. 1959 [1961]. WR 105: 28

The abundance of the scrub oak acorn crop showed a definite correlation with annual weight differences of buck deer harvested. Correlations between saw palmetto berries and deer were weaker than those between acorns and deer. The present relationships, although not in all cases significant, support and strengthen the opinion that acorns and palmetto berries constitute an important part of the deer's diet and that elimination of oak for pine over extensive areas would be extremely detrimental to deer range.--From summ.

Hayes, Frank A., and James H. Jenkins. (Univ. Ga., Athens.) SOME THEORETICAL IMPLICATIONS OF POISONOUS PLANTS AND SOUTHEASTERN DEER DISEASES. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 174-177. 1959 [1961]. WR 105: 29

From food studies, impressions have been gained that wild deer possess an inherent resistance to practically all naturally occurring toxic materials. Many plants contribute to heavy losses to the livestock industry. In testing more than 300 drugs the authors found that white-tailed deer are less resistant than domestic goats to poisonous plants. Losses of white-tailed deer in the Southeast during the past 50 years to recurrent diseases cannot be attributed to infectious diseases nor to poisonous plants. It is suggested that attention should be given, in future studies, to the ecological role that poisonous plants might contribute to deer mortality.

Hoffmeister, Donald F. (Univ. Ill., Urbana.) THE KINDS OF DEER, ODOCOILEUS, IN ARIZONA. Am. Midland Nat. 67(1): 45-64, 6 figs. Jan. 1962. WR 105: 29

Two subspecies of mule deer (Odocoileus hemionus) and one subspecies of white-tailed deer (O. virginianus) occur in Ariz.

Noble, Robert E. (Miss. Game & Fish Comm.) PROGRESS REPORT ON WHITE-TAILED DEER PRODUCTIVITY STUDIES IN MISSISSIPPI. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 53-60, 1 fig. 1960 [1962]. WR 105: 29

Based on one season's collecting (60 ♀♀). Eighty-one fetuses were collected from 54 gravid tracts, an average of 1.5 fetuses per pregnant doe. The sex ratio of 64 fetuses was 27♂♂ : 37♀♀. An average of 1.60 corpora lutea per gravid tract and 1.46 fetuses in the same tracts (48 observations) indicated that the reproductive rate of these ♀♀ was operating at 90.9% of its potential capacity. "Some evidence is presented that seems to indicate that the adult sex ratio influences the sex ratio of fetuses in uteri. No evidence has been found to indicate that does on seriously over-browsed ranges produce more females in uteri than males. However, where the adult sex ratio was distorted in favor of does, the sex ratio in uteri was preponderantly in favor of females."--From auth. abstr.

Osebold, John W., J. R. Douglas, and John F. Christensen. (Univ. Calif., Davis.) TRANSMISSION OF ANAPLASMOSIS TO CATTLE BY TICKS OBTAINED FROM DEER. Am. J. Vet. Res. 23(92): 21-23. Jan. 1962. WR 105: 29

Summary: The transmission of anaplasmosis by ticks obtained from deer [Odocoileus hemionus columbianus] was effected in 2 of 5 splenectomized calves. The ticks used in the study were Dermocentor occidentalis and Ixodes pacificus. The importance of the infection cycle in deer and ticks is considered in relation to control of anaplasmosis in cattle. [With Interlingua summary.]

Pengelly, William Leslie. FACTORS INFLUENCING PRODUCTION OF WHITE-TAILED DEER ON THE COEUR D'ALENE NATIONAL FOREST, IDAHO. Ph.D. thesis, Utah State Univ. 205 p. 1961. [From abstr. in Dissertation Abstr. 22(6), 1961.] WR 105: 29

Based on a 10-year field study conducted during 1949-59 in northern Idaho. The vegetation, climate, geology, history, big game populations, and methods of study are described. Estimates of white-tailed deer populations from 1921 through 1958 indicate a 600% increase despite temporary setbacks following 3 severe die-offs (1932, 1949, 1950) and 3 minor starvation losses (1927, 1943, 1945). Careful herd control and attempts to provide proper forage and cover combinations by habitat manipulation are suggested. The seral shrubs in the forest understory and clearings in many areas are important as winter range for white-tailed deer. Suggestions for prolonging the seral stages by selective chemical spraying and timber stand improvements are included.

Reilly, James R., Thelma F. Muraschi, and Donald J. Dean. (N. Y. Conserv. Dept., Albany.) EXPERIMENTAL LEPTOSPIRA POMONA INFECTION IN WHITE-TAILED DEER, ODOCOILEUS VIRGINIANUS AND IN CATTLE. J. Am. Vet. Med. Assoc. 140(1): 53-57, 1 fig. 1 Jan. 1962. WR 105: 29

Reilly, James R., Thelma P. Muraschi, and Donald J. Dean. (N. Y. Conserv. Dept., Albany.) LEPTOSPIROSIS IN THE WHITE-TAILED DEER, ODOCOILBUS VIRGINIANUS. Cornell Vet. 52(1): 94-98. Jan. 1962. WR 105: 30

Summary: A unique circumstance permitted a serologic and cultural survey of a large number of wild deer for evidence of leptospirosis. One strain serotype, L. pomona, was isolated from urine of 1 of 31 animals thus examined. There were no isolations on cultural examination of amniotic fluid from 13 deer. Antibodies to antigens of one or more of 10 leptospiral serotypes tested were detected in serum of 23 of 103 deer.

Wallmo, O. C., A. W. Jackson, T. L. Hailey, and R. L. Carlisle. (Texas Agr. Expt. Sta., College Station.) INFLUENCE OF RAIN ON THE COUNT OF DEER PELLET GROUPS. J. Wildl. Mgmt. 26(1): 50-55, 2 figs. Jan. 1962. WR 105: 30

On four study areas in Texas estimates of density of populations of deer (Odocoileus spp.) were based on samples of abundance of fecal droppings. Radical fluctuations in density of droppings indicated that some factor other than population change was involved. On the Black Gap Area 91% of marked groups of fecal pellets were washed away by rain in four months. On the Black Gap and Del Norte areas there was a significant negative correlation between density of pellet groups and number of heavy rains during the sampling intervals. On the Sierra Diablo Area, which had heavier vegetative cover, and the Dockery Area, which had level terrain, correlations were not statistically significant but the influence of rainfall was empirically evident. Abundance of fecal droppings on the range is a faulty index to deer population level when washing rains occur during the sampling interval.--Auth. abstr.

MAMMALS--MARINE

Gilmore, Raymond W. GRAY WHALES: UNTOUCHABLES WITH STATUS. San Diego 13 (3): 62-63, 80-84, illus. Jan. 1961. [From J. Mammal. 42(4), 1961.] WR 105: 30

Gilmore, Raymond W. WHALES, PORPOISES AND THE U. S. NAVY. Norsk Hvalfangst-Tidende (Norwegian Whaling Gazette) 50(3): 89-108. Mar. 1961. [From J. Mammal. 42(4), 1961.] WR 105: 30

Norris, Kenneth S., and John H. Prescott. (Univ. Calif., Los Angeles.) OBSERVATIONS ON PACIFIC CETACEANS OF CALIFORNIAN AND MEXICAN WATERS. Univ. Calif. Publ. Zool. 63(4): 291-402, 12 figs. + 15 pls. 21 Nov. 1961. $2.25. WR 105: 30

Observations on distribution, morphology, reproduction, behavior, mortality and disease for 15 species of cetaceans.

Sergeant, D. E. (Fisheries Res. Board Canada, Montreal.) WHALES AND DOLPHINS OF THE CANADIAN EAST COAST. Fisheries Res. Board Canada, Circ. no. 7. ii + 17 p., illus. Nov. 1961. WR 105: 30

The recognition and behavior of the approximately 15 kinds of whales and dolphins of importance to the Canadian East Coast are treated in this identification guide. Unnumbered record sheets are appended.

Slijper, E. J. THE STILL UNEXPLAINED MYSTERY OF THE WHALES. Norsk Hvalfangst-Tidende (Norwegian Whaling Gazette) 50(2): 41-54, illus. Feb. 1961. [From J. Mammal. 42(4), 1961.] WR 105: 30

Tikhomirov, E. A. [THE PROBLEM OF WARM-BLOODED ANIMALS IN THE DIET OF THE SEA-LION.] Izvest. Tikhookeansk. Nauch.-Issled. Inst. Rybn. Khoz. i Okeanogr. 47: 185-186. 1959. [From Biol. Abstr. 36(23), 1961, from Referat. Zhur., Biol., 1961, no. 2D623.] WR 105: 30

Translation [from Russian]. In May 1956 near the Yamsk Islands, a sea-lion (Eumetopius jubatus) was procured, in the stomach of which a pup of a ringed seal (Phoca hispida) was found.

MAMMALS--OTHER GROUPS

Eisenberg, John F. (Univ. Calif., Berkeley.) OBSERVATIONS ON THE NEST BUILDING BEHAVIOUR OF ARMADILLOS. Proc. Zool. Soc. London 137(2): 322-324, 1 fig. Sept. 1961. WR 105: 31

Comparative studies of nest building in 5 genera (Dasypus, Tolypeutes, Priodontes, Euphractus, and Chaetophractus) of armadillos.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Boswall, J. A WORLD CATALOGUE OF GRAMOPHONE RECORDS OF BIRD VOICE. Cornell Univ. Lab. Ornithol., Bio-Acoustics Bull. 1(2): 1-12. 1961. [From Auk 78(4), 1961.] WR 105: 31

"A useful list of commercially published records issued between 1910-1960. The list is by authors, giving title, diameter of the disk, rpm, publisher, and usually the number of species included. An introduction indicates the countries and zoogeographic regions in which published bird recordings have been made, and the total species (approximately 963) covered. Unfortunately there is no geographic cross referencing, and in a few instances neither the title of the disk nor the comment in this catalogue indicates the country or area whose birds are included."--E.E.

Graber, Jean W. (Univ. Ill., Urbana.) DISTRIBUTION, HABITAT REQUIREMENTS, AND LIFE HISTORY OF THE BLACK-CAPPED VIREO (VIREO ATRICAPILLA). Ecol. Monographs 31(4): 313-336, 15 figs. Autumn 1961. WR 105: 31

The black-capped vireo appears to be restricted in its distribution by rigid requirements of vegetative and climatic factors. It does not adapt to modified conditions and therefore becomes very limited in its distribution. No factor was found in the life cycle that could account for its limited numbers. Its habits are similar to those of other vireos. Its nesting success is low compared to that of other passerines, but not lower than that of a closely related, more widely distributed species, Vireo bellii. The black-capped vireo suffers large reproductive losses because of cowbird parasitism, but so does Bell's vireo. The black-capped vireo's low reproductive success is probably compensated for by the survival rate and longevity of adults. The species appears to be as long-lived as certain more widely distributed forms.--From summ.

Hailman, Jack P. (Duke Univ., Durham, N. C.) PECKING OF LAUGHING GULL CHICKS AT MODELS OF THE PARENTAL HEAD. Auk 79(1): 89-98, 3 figs. Jan. 1962. WR 105: 31

The stimuli that elicit and direct the pecking of the chicks of laughing gulls appear to differ somewhat from those to which chicks of other species of gulls react; however, the differences are not necessarily due to specific differences in the morphology of the adult heads. It is suggested that the best comparative study would involve comparisons of the ontogenetic development of pecking behavior.--From summ.

Hergenrader, Gary L. (Univ. Nebr., Lincoln.) THE INCIDENCE OF NEST PARASITISM BY THE BROWN-HEADED COWBIRD (MOLOTHRUS ATER) ON ROADSIDE NESTING BIRDS IN NEBRASKA. Auk 79(1): 85-88, 1 fig. Jan. 1962. WR 105: 31

Based on a survey of 338 miles of Nebr. roadsides. Of the 172 nests located, 59 were those of red-winged blackbird; 48, mourning dove; 31, meadowlark; 17, dickcissel; and 17, brown thrasher. Of the red-winged blackbird nests 54% were parasitized by brown-headed cowbirds. For dickcissel nests 53% were parasitized, and for meadow lark nests the figure was 16%. No parasitized nests of either the brown thrasher or the mourning dove were found.

Hostetter, D. Ralph. LIFE HISTORY OF THE CAROLINA JUNCO / JUNCO HYEMALIS CAROLINENSIS BREWSTER. Raven 32(9&10): 97-170. Sept.-Oct. 1961. WR 105: 31

Adapted and condensed from a doctoral dissertation (Univ. Va., 1938). Study conducted in Giles County, Va., during 1936-8.

Ilienko, A. L. [PECULIARITIES OF THE ECOLOGY OF PASSER DOMESTICUS L. AFFECTING THEIR INFESTATION WITH GAMASID MITES.] Zool. Zhur. 38(7): 1060-1068. 1959. Twenty-one page CSIRO transl. no. 5477 (1961) available at $2.60 from OTS, U. S. Dept. Commerce, Washington 25, D. C. WR 105: 32

[Translation from Russian.] Abstract from Tech. Transl. 6(11), 1961: Self-cleaning decreases the number of mites on sparrows. The greater the availability of food at sites the less time the bird spends procuring the necessary food and the more consideration it gives to cleaning itself of parasites. According to our observations, in the morning after the departure from the nests and particularly after feeding the sparrows sit in flocks on trees, clean themselves, preen each feather and peck off the mites.

Johnston, David W. (Wake Forest Coll., Winston-Salem, N. C.) TIMING OF ANNUAL MOLT IN THE GLAUCOUS GULLS OF NORTHERN ALASKA. Condor 63(6): 474-478, 1 fig. 1961. WR 105: 32

Summary: In the Cape Thompson region of arctic Alaska, the glaucous gull (Larus hyperboreus) lays its eggs in late May or early June. Adults begin their annual molt before or soon after the eggs are laid, that is, by the end of May. This early molt is believed to be an adaptation whereby this species is able to complete, or nearly complete, both breeding and molt during the abbreviated summer period. Glaucous gulls were found nesting in two distinct habitats: (1) on precipitous sea cliffs and (2) on small islands or peninsulas or at the edge of lagoons and lakes. The cliff-inhabiting individuals bred before those at the lagoons. The timing of nesting is not necessarily related to an abundant supply of eggs and/or young of kittiwakes since other food items are readily available throughout the summer.

Kilham, Lawrence. (Lyme, N. H.) BREEDING BEHAVIOR OF YELLOW-BELLIED SAPSUCKERS. Auk 79(1): 31-43, 1 fig. Jan. 1962. WR 105: 32

Kluyver, H. N. (Inst. Oecol. Onderzoek, Kemperbergerweg 11, Arnhem, Netherlands.) FOOD CONSUMPTION IN RELATION TO HABITAT IN BREEDING CHICKADEES. Auk 78(4): 532-550, 1 fig. Oct. 1961. WR 105: 32

Nolan, Val, Jr. (Ind. State Univ., Bloomington.) A METHOD OF NETTING BIRDS AT OPEN NESTS IN TREES. Auk 78(4): 643-645, 1 fig. Oct. 1961. WR 105: 32

The construction and operation of a small hoop net, resembling a butterfly net, as a device for catching birds at open nests in trees and shrubs is described and figured. In contrast with the mist net, "the hoop net is a selective trap for nesting birds. It can be sprung at the investigator's convenience, is easily set, and requires no cutting of swathes through vegetation. Its effectiveness is not limited to windless days, nor is it important that it escape detection by the bird to be caught." It usually can be set up at any height and it is easily portable.

Odum, Eugene P., Clyde E. Connell, and Herbert L. Stoddard. (Univ. Ga., Athens.) FLIGHT ENERGY AND ESTIMATED FLIGHT RANGES OF SOME MIGRATORY BIRDS. Auk 78(4): 515-527, 1 fig. Oct. 1961. WR 105: 32

Three patterns of fat deposition in relation to migration are now evident: (1) short-range migrants (e.g., savannah sparrow) that become moderately obese but begin migration before peak deposition; (2) short-range migrants (e.g., white-throated sparrow) that begin migration after peak deposition; (3) long-range migrants (e.g., scarlet tanager prior to trans-Gulf flights) that become extremely obese (fat up to 50% of body weight) just prior to flight. Measured lipid levels and estimated flight ranges are presented for samples of birds (totalling 853 individuals of 15 spp.) killed during nocturnal migration at a Gulf coast TV tower near Tallahassee, Fla. The possibility of distinguishing between Florida-West Indian and trans-Gulf migrants on the basis of lipid levels is discussed.--From summ.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Saunders, Aretas A. (P. O. Box 141, Canaan, Conn.) THE SONGS AND CALLS OF THE WOOD THRUSH. Auk 78(4): 595-606, 19 figs. Oct. 1961. WR 105: 33
Graphic analyses of wood thrush songs.

Selander, Robert K., and Charles J. La Rue, Jr. (Univ. Texas, Austin.) INTERSPECIFIC PREENING INVITATION DISPLAY OF PARASITIC COWBIRDS. Auk 78(4): 473-504, 2 figs. Oct. 1961. WR 105: 33
Brown-headed cowbirds (Molothrus ater) approach individuals of other species of birds and solicit heteropreening by giving a special head-bowed display. Avian appeasement displays are discussed, and it is suggested that the interspecific display of parasitic cowbirds is an adaptation for parasitism, functioning to decrease the probability of attack by individuals of host species by decreasing their aggressive tendencies.--From auth. summ.

Tutor, Billy M. (Texas Fish & Game Comm., Burnet.) NESTING STUDIES OF THE BOAT-TAILED GRACKLE. Auk 79(1): 77-84. Jan. 1962. WR 105: 33
Based on studies made during the summers of 1959 and 1960 near Sinton, Texas. Sixty-nine per cent of the 1700 eggs laid in 517 nests during 1959 produced fledlings. The average clutch size was 3.29 ± 0.12 and the incubation period was 13 days. Mortality of the young was due to water moccasins and to nests sliding down the stems of bulrush or to nests overturning. Grackles preyed extensively on nests of water birds outside of the confines of the grackle colonies, but nests of water birds located within the grackle colonies were not harmed.--From auth. summ.

Verner, Jared. (La. State Univ., Baton Rouge.) NESTING ACTIVITIES OF THE RED-FOOTED BOOBY IN BRITISH HONDURAS. Auk 78(4): 573-594, 2 figs. Oct. 1961. WR 105: 33
Formation and maintenance of pair bond, territory, nest construction, copulation, laying, incubation, care of young, and development and activities of young are the behavioral activities discussed.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Hamilton, Terrell H. (Harvard Biol. Laboratories, Cambridge, Mass.) THE HABITATS OF THE AVIFAUNA OF THE MESQUITE PLAINS OF TEXAS. Am. Midland Nat. 67(1): 85-105. Jan. 1962. WR 105: 33
The habitat preferences of the breeding and wintering elements of the local avifauna are tabulated. Six terrestrial and one open water habitat are recognized. Speculations are made on the problem of why some western species reach their eastern limits in central Texas.--From auth. abstr.

BIRDS--POPULATIONS & FLUCTUATIONS

Mitchell, Meribeth J. (Western Wash. Coll., Bellingham, Wash.) BREEDING BIRD POPULATIONS IN RELATION TO GRASSLAND SUCCESSION ON THE ANOKA SAND PLAIN. Flicker 33(4): 102-108, 3 figs. Dec. 1961. WR 105: 33
A comparative study of bird populations inhabiting 5 different stages of grassland succession in Minn.

BIRDS--ECONOMICS, CONTROL, MORTALITY

Janzen, Daniel H. (Bur. Sport Fisheries & Wildl., Washington 25, D. C.) THE PROBLEM OF NUISANCE AND CROP-DEPREDATING BIRDS IN THE UNITED STATES. IUCN Symposium (Warsaw) 15-24 July 1960. p. 79-84. 1961. WR 105: 33
The program of the Bureau of Sport Fisheries and Wildlife emphasizes research in bird ecology, and techniques of damage appraisal, crop protection, and population reduction. Nuisance or crop-depredating birds include: finches, crows, blackbirds, starlings, English sparrows, robins, rock pigeons, and waterfowl.

BIRDS--PARASITES AND DISEASES

Fedorov, Yu. V. [WILD BIRDS: HOSTS OF TICK LARVAE AND NYMPHS IN THE TOMSK FOCUS OF TICK-BORNE ENCEPHALITIS.] Nauchno-Issledovatel'skii Inst. Vaktsin i Syvorotok (Tomsk) Trudy, USSR, 8: 125-132. 1956. Five page transl. (1961) available at $1.10 from OTS, U. S. Dept. Commerce, Washington 25, D. C. WR 105: 34

[Translation from Russian.] Abstract from Tech. Transl. 6(10), 1961: In the natural conditions of the Tomsk focus the following birds may act as carriers of various stages in the metamorphosis of the wood tick: tree pipit, Siberian chickadee, fieldfare, thrush, great spotted woodpecker, finch, yellowhammer, whitecapped bunting, common bullfinch, European bullfinch, northern wood warbler, great titmouse, European starling, jay, and goldfinch. The occurrence of ticks on wild birds depends upon the season of the year. Ticks appeared on birds on May 9th in 1955. Peak frequency of occurrence and peak abundance were found in the second half of June, after which the abundance of ticks gradually declined until the first ten days of August, the frequency of occurrence dropping fairly sharply during the first half of July. At the end of that month the frequency was found to increase, after which it again dropped off to a minimum by the first half of August. Both parameters exhibit a second rise during the second half of August. The last ticks were found at the middle of September. According to our findings, no ticks are found on birds during the winter. In the Tomsk natural focus of tick-borne encephalitis birds are hosts to the larvae and nymphs of the wood tick.--Author.

Fedorov, Yu. V. [FURTHER OBSERVATIONS ON THE SIGNIFICANCE OF WILD BIRDS AS HOSTS OF IXODES TICKS IN THE TOMSK FOCUS OF TICK-BORNE ENCEPHALITIS.] Nauchno-Issledovatel'skii Inst. Vaktsin i Syvorotok (Tomsk) Trudy, USSR, 9: 23-26. 1958. Five page transl. (1961) available at $1.10 from OTS, U. S. Dept. Commerce, Washington 25, D. C. WR 105: 34

[Translation from Russian.] Abstract from Tech. Transl. 6(10), 1961: In the natural conditions of the Tomsk focus of tick-borne encephalitis the following are active hosts of wood tick larvae and nymphs: the tree pipit, the fieldfare, the thrush, the song thrush, the yellowhammer, the whitecapped bunting, the spring wood warbler, the northern wood warbler, the magpie, the European starling, the Arctic rosy finch, the finch, and the European bullfinch. A large number of the larvae, nymphs, and imagoes of Ixodes crenulatus ticks was found on the bank swallow. Ticks appeared on the birds during the first half of May, their number reaching a maximum at the middle of June and dropping to a minimum by the middle of August.--Author.

Fedorov, Yu. V. [THE ROLE OF ORNITHOFAUNA IN THE NATURAL FOCI OF TICK-BORNE ENCEPHALITIS.] Nauchno-Issledovatel'skii Inst. Vaktsin i Syvorotok (Tomsk) Trudy, USSR, 9: 27-32. 1958. Seven page transl. (1961) available at $1.10 from OTS, U. S. Dept. Commerce, Washington 25, D. C. WR 105: 34

[Translation from Russian.] Abstract from Tech. Transl. 6(10), 1961: Between 1954 and 1956 we made a virological exploration of wild birds and of wood ticks taken from them in the districts of Tomsk (the environs of the villages of Zavarzino, Kutashev, Rodionovo, Trubochevo, and Maloe Protopopovo). We examined 1,159 wild birds, belonging to 6 orders and including 39 species. We used 4,700 white mice, 15 rabbits, and 10 guinea pigs in our research on the birds and ticks, and in studying the properties of the isolated strains. We isolated a total of nine strains of the virus of tick-borne encephalitis, six from the birds and three from the larvae and nymphs found on the birds.--Author.

Herman, Carlton M. (Patuxent Wildl. Res. Center, Laurel, Md.) THE ROLE OF BIRDS IN THE EPIZOOTIOLOGY OF EASTERN ENCEPHALITIS. Auk 79(1): 99-103. Jan. 1962. WR 105: 34

A review paper.

BIRDS--PARASITES AND DISEASES--Continued

Nibley, Carlyle, Jr. (Univ. Md., College Park.) TICK COLLECTIONS FROM GROUND-FEEDING BIRDS AT THE PATUXENT RESEARCH REFUGE, LAUREL, MARYLAND. Wildl. Disease no. 22. 10 p. Jan. 1962. WR 105: 35
[Numbers 22 and 23 on one microcard.] Abstract: During one year 1279 examinations were made of 839 captured birds representing 34 species. Three species of ticks (Haemaphysalis leporis-palustris, Ixodes brunneus, and Ixodes dentatus) were collected. I. dentatus was frequent within the ear of its hosts. Many new host and locality records are reported.

Stamm, Donald D. (Communicable Disease Center, Box 61, Montgomery, Ala.) PRESENT STATUS OF KNOWLEDGE ON THE ECOLOGY OF EASTERN ENCEPHALITIS VIRUS IN THE UNITED STATES. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 169-173. 1959 [1961]. WR 105: 35
Recently extensive field and laboratory studies on Eastern Encephalitis (EE) have greatly increased our knowledge of the ecology of this disease. Human and domestic animal infections with EE are merely above-surface fractions of the iceberg of its real activity in nature. Wild bird populations have been shown to be greatly involved in EE epidemics. During 1956 in Mass. and N. J., 45-54% of selected avian populations had antibodies to EE. Most epidemics occur during the late summer when there are maximum populations of birds and mosquitoes. A number of gaps in our knowledge of EE exist. We are concerned with how the virus survives the winter months, the ecological factors which provoke outbreaks in domestic animals and man, the possibility of predicting epidemics before they occur, and developing methods for controlling the disease. Methods for preventing outbreaks of EE (such as the rapid reduction of mosquito or bird populations) must be evaluated. Those concerned with the protection of wildlife against unwise and uncritical control procedures should accumulate a well-founded knowledge concerning EE and be prepared to use facts rather than emotion in the formulation of programs.--From abstr. by Gordon M. Clark.

Worth, C. Brooke, and Wilbur G. Downs. (Trinidad Regional Virus Lab., Port-of-Spain.) RECOVERIES IN THE WEST INDIAN REGION OF BIRDS BANDED IN NORTH AMERICA, 1951-1960 AND THEIR POSSIBLE RELATIONSHIP TO THE TRANSPORT OF ARTHROPOD-BORNE VIRUSES. Wildl. Disease no. 24. 17 p. Jan. 1962. WR 105: 35
[Numbers 24 and 25 on one microcard.] Abstract: This study represents an attempt to correlate information on banded birds in the files of the Fish and Wildlife Service with possibility that intercontinental migrants may serve to disseminate arthropod-borne viruses. It was found that the vast majority of 1067 recoveries pertained to ducks (55%) or conspicuous water birds such as terns and gulls (34%) while only 8 passerine birds (0.8%) representing 6 species were recovered. Since the sample is thus biased, it becomes evident that the desired information will have to await banding schemes designed to give a more representative coverage of the migrating avifauna.

GAME BIRDS--GENERAL

Christensen, Glen C. (Nevada Fish & Game Comm., Reno.) PRELIMINARY RESULTS FROM NEVADA'S PARTICIPATION IN THE FOREIGN GAME INTRODUCTIONS PROJECT. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 130-135. 1961 [1962]. WR 105: 35
Trapping results, Nevada releases, the current status of exotic releases, and future project plans are summarized. Releases in Nevada totalled 4,329 game birds of 3 different species (gray francolins, black francolins, and common sand grouse).

QUAIL

Bartholomew, George A., and Richard E. MacMillen. (Univ. Calif., Los Angeles 24.) WATER ECONOMY OF THE CALIFORNIA QUAIL AND ITS USE OF SEA WATER. Auk 78(4): 505-514, 2 figs. Oct. 1961. WR 105: 36

On a dry diet captive California quail showed a mean weight loss of 1.6% of initial body weight per day. Mean length of survival without water was 28.1 days for ♀♀ and 40.6 days for ♂♂. Ad libitum consumption of distilled water averaged 5.2% body weight per day, and the minimum consumption of water on which body weight could be maintained averaged 1.8% body weight per day. The low water requirements and the tolerance of dehydration of California quail allow them to remain independent of surface water as long as green vegetation or insects can be found. Under conditions of severe drought or heat stress brackish or saline water may contribute to survival, but California quail apparently cannot utilize the sea as a water source. Although they are not successful in deserts, California quail have lower water requirements, greater tolerance of dehydration, and can utilize water of higher salinity than the mourning dove, which is a conspicuously successful desert species. This situation is probably related to the limited mobility of the quail, which precludes periodic visits to distant water sources.--From summ.

Harris, Bruce K. (N. Mex. Dept. Game & Fish, Carlsbad.) QUAIL TREND ROUTES AS A MANAGEMENT TOOL. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 200-204. 1960 [1961]. WR 105: 36

Quail trend routes yield information on quail per linear mile, average brood size, average covey size, success of hatch, and peak hatch period. They have definite advantages over other types of statewide survey since (1) they are practical and economical, (2) they have been found statistically sound in Ariz., and (3) they have been successfully applied on a management basis by at least 2 other states.

Holman, J. Alan. (Ill. State Normal Univ., Normal.) OSTEOLOGY OF LIVING AND FOSSIL NEW WORLD QUAILS (AVES, GALLIFORMES). Bull. Fla. State Museum (Biol. Sci.) 6(2): 131-233, 3 figs. 1961. $1.55. WR 105: 36

This paper represents in part a doctoral dissertation accepted at the University of Florida in 1961.

Howes, J. R., and W. D. Ivey. (Auburn Univ., Auburn, Ala.) COTURNIX QUAIL FOR VETERINARY RESEARCH. J. Am. Vet. Med. Assoc. 140(2): 162-163, 2 figs. 15 Jan. 1962. WR 105: 36

Schemnitz, Sanford D. (Pa. State Univ., University Park.) ECOLOGY OF THE SCALED QUAIL IN THE OKLAHOMA PANHANDLE. Wildl. Monographs no. 8. 47 p., 16 figs. Dec. 1961. WR 105: 36

Information on the abundance, distribution, food, feeding and nesting habits, and cover needs of scaled quail in 3 vegetation communities (pinon-juniper, shortgrass, and sandsage-grassland) of Okla. Average winter home range was 52.3 acres. Summer range averaged 1,370 acres. Average clutch size was 12.7 eggs and average brood size was 10.0 chicks. The average scaled quail bag per hunter hour increased from 1.1 to 1.5 during 3 hunting seasons. Despite increasingly severe drought conditions, brood size, juvenile-to-adult age ratios, and the rate of hunting success increased during the study period. Maintenance and development of suitable cover is stressed as an important management tool. Development techniques include fencing waste and eroded areas, planting of drought resistant trees and shrubs, pruning to promote bushy growth, and the construction of artificial structures (brush shelters). --From summ.

Speake, Dan W., and Arnold O. Haugen. (Ala. Coop. Wildl. Res. Unit, Auburn.) QUAIL REPRODUCTION AND WEATHER IN ALABAMA. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 85-97, 3 figs. 1960 [1962]. WR 105: 37

Evidence on the effects of spring and summer weather on bobwhite quail reproductive success in Alabama is presented. Data derived from 57,080 quail wings contributed by hunters during an 8-year period, and representing the hatching seasons 1952 through 1959. Additional data were obtained from a quail population study made concurrently on a 1,409-acre area in the Alabama Piedmont, from local brood observations and a quail cock call route. Quail reproduction as measured by percentage of juveniles in wing samples was best when total rainfall was higher than normal, or normal and accompanied by average seasonal temperatures no higher than normal during the period from May through August. Chronology of the hatch, also based on wing samples, was associated with reproductive season weather in such a manner that the data support findings relating to the effects of weather on reproduction. Covey dispersal observations, brood observations, and state-wide quail wing data when compared with the central Alabama call index, indicate that the call index can be used to estimate the relative amount of nesting activity. Literature is reviewed and discussion is presented on the possible significance of these findings and the possibility of using weather data and call-index routes to predict relative quail reproduction success from year to year.--From auth. summ.

Stair, John L. (Ariz. Game & Fish Dept., Phoenix.) ARIZONA'S FIRST MEARN'S QUAIL HUNT. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 172-175. 1961 [1962]. WR 105: 37

A detailed analysis of this hunt is presented. Forty-five Mearn's quail were taken by 117 hunters during a 2-day hunt. Of 43 quail classified, 55.8% were young. For Gambel's quail, higher productivity is indicated since 64.2% of the bag were young.

PHEASANTS

Harper, Harold T. (Calif. Dept. Fish & Game, Sacramento.) THE EFFECTS OF A THREE YEAR LIMITED HEN SEASON ON PHEASANT POPULATIONS IN CALIFORNIA, 1955-1957. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 168-176. 1960 [1961]. WR 105: 37

Regulations have been imposed on pheasants by almost all states allowing only ♂♂ to be taken which leaves the ♀♀ in greater numbers after each breeding season than necessary for the next year's reproduction. From Calif. studies it has been determined that about 65% of the ♀♀ produced each year are lost regardless of hunting, and that up to about 45% of the fall ♀ population can be removed annually by hunting without endangering reproduction on areas in Calif. where hen shooting has been permitted for the past 18 years, and where the wild hen kill has exceeded the cock kill no measurable decrease in the pheasant population has occurred. The limited hen season afforded up to 120,000 additional pheasants harvested annually without any increase in cost to the hunter or without harm to the pheasant population. A limited number of hens can be taken from an established pheasant population each year even in moderate production years.--From auth. concl.

Tuttle, Herman J. (Va. Comm. Game & Inland Fisheries, Richmond.) VIRGINIA'S FOREIGN GAME PROGRAM--A PROGRESS REPORT. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 70-73. 1959 [1961]. WR 105: 37

Preliminary report of game farm and release information of eastern and western Iranian blackneck pheasants in Virginia during 1957-9.

GROUSE, PARTRIDGE, ETC.

Jenkins, David. (Univ. Aberdeen, Aberdeen, Scotland.) POPULATION CONTROL IN PROTECTED PARTRIDGES. J. Animal Ecol. 30(2): 235-258. Nov. 1961. WR 105: 38

Summary: 1. A population of partridges on 640 acres of intensively farmed arable land on a large game preserve in the south of England was studied by means of marking individuals for 3 years. 2. While there may have been local differences in the chicks' resistance to various mortality factors, the reproductive rate, and hence the number of partridges available for exploitation, was controlled chiefly by mortality among the small young due to unfavourable cool, wet and windy summer weather. 3. None the less the preserved partridges in the neighbourhood of the study area apparently reproduced at a higher rate than was necessary to maintain their breeding density, thus creating a population surplus that lived unproductively in marginal habitats. 4. The mortality of adult birds including deaths through shooting was insufficient to control numbers at any time. 5. The density of over-wintering and breeding partridges was controlled chiefly by the suitability of their environment. 6. Management should be directed at improving the habitat and at properly exploiting the annual surplus. Landowners need have no fear of the consequences of shooting all excess birds, since any subsequent deficiency of breeding stock is likely to be made good by an improved survival of the remainder plus the immigration of more birds from marginal habitats elsewhere.

Moreland, Raleigh, and J. Burton Lauckhart. (Wash. Dept. Game, Olympia.) CHUKAR PARTRIDGE POPULATION FLUCTUATIONS. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 188-190. 1960 [1961]. WR 105: 38

In general, the chukar is not as hardy a bird as the pheasant, and it appears to rank below the valley quail and Hungarian partridge in ability to cope with winter snow. Losses can be expected in the northern states. Chukars also vary considerably annually in breeding success. One "can always depend on the remarkable recovery capacity of the chukar, to bring it back quite rapidly after ...winter catastrophe[s]."

Tomlinson, Roy E. (N. Mex. Dept. Fish & Game, Albuquerque.) IS NEW MEXICO CLIMATICALLY SUITABLE FOR CHUKARS? Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 191-199 + 5 figs. 1960 [1961]. WR 105: 38

Two subspecies of chukars have been released in N. Mex. since 1931. The total number of Indian chukars released was 7,678. Indian chukars failed to become established. Since 1951, emphasis has been placed on the Turkish chukar. Seven release areas have received 6,607 birds of that strain and relatively large releases were made in each area. In 30 years, from 14,285 birds released, only 28 broods have been reported or observed. Only the northwest corner of N. Mex. is climatologically suitable for chukar habitat and in the future emphasis should be placed on this area.--From summ.

Williams, H. Warrington. (Utah State Univ., Logan.) THE INFLUENCE OF PHYSICAL AND BIOLOGICAL FACTORS ON THE RALLY CALL OF THE CHUKAR PARTRIDGE (ALECTORIS GRAECA) WITH REGARD TO USE OF THE CALL AS A CENSUS METHOD. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 117-129. 1961 [1962]. WR 105: 38

"Physical factors influence calling and are predictable in their effects. However, other factors are also important in determining when and to what extent a chukar calls. Internal motivation of the individual bird, contact with members of the same and other species, and possibly other unknown factors also have an effect. Until the effects of all the variables acting to influence rally calling are known, accurate censusing of the chukar by call counts seems unlikely."

TURKEY

Webb, Paul M. (Ariz. Game & Fish Dept., Glendale.) TURKEY TRAPPING AND TRANSPLANTING IN ARIZONA. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 182-187. 1960 [1961]. WR 105: 39

Ariz. is using both the drop net and the cannon net trap in their turkey trapping program. The details of the development of their successful program of turkey trapping and transplanting are outlined in this paper.

DOVES AND PIGEONS

Critcher, T. S., and W. Scott Overton. (N. C. Wildl. Resources Comm., Raleigh.) PRELIMINARY EVALUATION OF THE CONTROLLED ROAD SIGHT COUNT AS AN INDEX TO MOURNING DOVE POPULATION LEVELS. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 105-123. 1960 [1962]. WR 105: 39

Analyses of N. C. biologists' uncontrolled road counts, available by month from 1949 to 1958, and controlled road counts conducted in spring and summer of 1960, are presented. The usefulness of winter and spring counts in predicting the Sept. index is not as great as found elsewhere (Ky.), largely because of less inherent variability in the Sept. index in N. C. In the controlled study, it was shown that the May road count index of an individual road was a better predictor of the Sept. index of that road than was the May call count index. There is also an indication that the two indices in May contribute independent information about the Sept. index. These controlled studies should be continued over several years to determine the predictability of annual variation. The need for definition and annual estimation of a pertinent characterization of the fall and/or winter population density, either regionally or by management compartments, is discussed and emphasized. This quantity (or quantities) is vitally needed in evaluation and calibration of present predictors, and will in addition provide a general yardstick against which to measure the success of the management program. It is strongly recommended that road count and call count data which have been collected in the SE during the past 10 years be reviewed in the same manner as the N. C. and Ky. Data.--From summ.

Fessler, Floyd R. (SCS, Nashville, Tenn.) MANAGING WOOLY CROTON FOR DOVES AND BOBWHITES. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 74-77, 3 figs. 1960 [1962]. WR 105: 39

Establishment of Croton capitatus can be accomplished by seeding. Sow the seed in late winter or early spring and cover the seed by disking. Fertility requirements are not known. Observation of existing stands indicates that the more fertile the soil is, the better the growth and production. Often there is sufficient seed present to establish a stand by disking or plowing. If not, broadcasting 15 to 20 pounds of seed per acre is recommended. References of utilization of wooly croton by mourning doves and bobwhites are cited.

Harrison, C. J. O. (London, England.) NOTES ON THE BEHAVIOR OF THE SCALY DOVE. Condor 63(6): 450-455. Nov. 1961. WR 105: 39

A comparison of the scaly dove with the Inca dove as described in R. F. Johnston's paper [see WR 98: 57]. Includes information on plumage, voice, head bobbing, mutual preening, vertical tail fanning, nest calling, aggressive fleeing behavior, and driving.

Kiel, W. H., Jr. (King Ranch, Kingsville, Texas.) MOURNING DOVE MANAGEMENT IN EASTERN UNITED STATES. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 19-21. 1959 [1961]. WR 105: 39

Summary: Management of the mourning dove is a responsibility of the Bureau of Sport Fisheries and Wildlife. Suggestions for a management program have been published by Foote (1953, 1957) and others. Research and management projects were curtailed after the conclusion of the Cooperative Mourning Dove Study in 1953. Progress and needs for three projects are discussed: nestling banding, reorganization of the call-count survey, and survey of hunting kill.

Mace, Robert U., and Wesley M. Batterson. (Oreg. State Game Comm.) RESULTS OF A BAND-TAILED PIGEON BANDING STUDY AT NEHALEM, OREGON. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 151-153 + 1 fig. 1961 [1962]. WR 105: 40

A total of 1,870 band-tailed pigeons was banded at Nehalem, Oreg., during 1950-9. Band recoveries amounted to 9.1%--of these approximately 44% were made the first year and 91% within 3 years of banding. Approximately 60% of all band recoveries were made within one mile of the banding station and an additional 8% within 50 miles. More intensive management of individual populations may be indicated if the results of this study are typical of the species. --From summ.

WATERFOWL

Barry, Thomas W. (Canadian Wildl. Serv., Edmonton, Alberta.) EFFECT OF LATE SEASONS ON ATLANTIC BRANT REPRODUCTION. J. Wildl. Mgmt. 26(1): 19-26, 5 figs. Jan. 1962. WR 105: 40

Observations of Branta bernicla hrota during three nesting seasons on Southampton Island, Northwest Territories, Canada, revealed that low production is associated with late clearance of snow and water from habitat. Because of the short Arctic summer, habitat clearance must coincide with the nesting stage of the brant's reproduction cycle, or the gonads regress. Atresis of ovarian follicles, resulting in non-nesting, may be an adaptation to the short season by eliminating nesting and incubation in seasons too retarded for young to reach flight stage by freeze-up. Atresia also enhances chances for adult survival to the next breeding season.--Author.

Chalquest, R. R., and Tats Matsuoka. (Wash. State Univ., Pullman.) TUBERCULOSIS IN A WILD DUCK. Wildl. Disease no. 25. 3 p. Jan. 1962. WR 105: 40

[Numbers 24 and 25 on one microcard.] Abstract: Avian tuberculosis was found in a wild mallard duck. Histopathologic studies, cultures, and animal inoculation studies indicated that the isolate was Mycobacterium avium.

Chamberlain, E. B., Jr. (1199 Hancock Drive, NE, Atlanta 6, Ga.) FLORIDA WATERFOWL POPULATIONS, HABITATS AND MANAGEMENT. Fla. Game & Fresh Water Fish Comm., Tech. Bull. no. 7. vi + 62 p., 12 figs. 1960. WR 105: 40

Results based on investigations made during 1948-1958. The topography, geology, soils, and climatic features are reviewed. Habitats were classified on the basis of vegetation and water characteristics. The water quality tolerances and preferences of the more important aquatic plants were investigated and the plants were classified into 5 groups. Duration and extent of water level fluctuation are shown to be important factors influencing the utilization and value of waterfowl habitat. During mid-winter inventories ducks accounted for 66.1%, coots for 32.2%, and geese for 1.7% of the total population. The total winter population of waterfowl averages about 1,444,000 birds. Resident hunting pressure ranged from 22,000 to 37,000, with hunter success ranging from 1.5 to 2.0 bird/hunter/day. Management techniques are geared to the degree of water level control that can be exercised.--From summ.

Chura, Nicholas J. (Patuxent Wildl. Res. Center, Laurel, Md.) SELECTIVE FOOD UTILIZATION BY JUVENILE MALLARDS. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 176-180. 1961 [1962]. WR 105: 40

Juvenile mallard ducklings selectively utilize accessible food coincident with age, and regulated in part by behavior. Plant foods become increasingly more abundant in the diet as the ducklings mature. The consumption of specific food items is influenced by the season, weather, water level, habitat, previous seed crops, and the conspicuousness of the food. The time of day influences the intensity of feeding.--From summ.

Dane, B., C. Walcott, and W. H. Drury. THE FORM AND DURATION OF THE DISPLAY ACTIONS OF THE GOLDENEYE (BUCEPHALA CLANGULA). Behaviour 14: 265-281. 1959. [From Auk 78(2), 1961.] WR 105: 41

Analysis of movie film provides a detailed catalog of displays. Two categories are distinguished: (1) flock displays and (2) precopulatory actions and copulation.

Erickson, Ray C. (Bur. Sport Fisheries & Wildl., Washington, D. C.) DIVING DUCKS--THEIR PAST AND FUTURE. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 277-282. 1959 [1961]. WR 105: 41

"Waterfowl survey records show that, as a group, the diving ducks are less successful in maintaining their numbers than the dabbler or 'puddle duck' species.... To find the basis for the differential rates of population gain and loss, a comparison of habits and productivity and mortality factors of diving ducks with those of an abundant and responsive species, namely mallard, may give clues to support or dispute these assumptions." These factors are considered in this paper under the major headings: Range, Sex differences, Nesting, Feeding habits, Flight habits, and Management.

Grieb, Jack R., Mitchell G. Sheldon, and Don J. Neff. (329 Locust, Ft. Collins, Colo.) THE NESTING CANADA GEESE OF MOFFAT COUNTY, COLORADO. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 136-146. 1961 [1962]. WR 105: 41

A detailed study conducted during 1956-9 of "the last segment of a once widespread breeding goose population" in Colo. Birds nesting in this area have a high production potential except in years of early flood crest on the Yampa. Clutch and brood sizes are large compared to studies in other areas. There is a lack of conflict between this flock and agricultural and ranching activities. A management program which includes an annual census, a seasonal bag limit instead of a daily bag and possession limit, and the construction of nesting structures on islands to combat the threat of flood waters is recommended.

LaPage, Geoffrey. (3 Barton Close, Cambridge, England.) A LIST OF THE PARASITIC PROTOZOA, HELMINTHS AND ARTHROPODA RECORDED FROM SPECIES OF THE FAMILY ANATIDAE. (DUCKS, GEESE, AND SWANS). Wildl. Disease no. 26. 109 p. Jan. 1962. [From Parasitol. 51(1-2), 1961.] WR 105: 41

[Published on 3 microcards.] This is a direct reprint of the paper by the same title published in Parasitology. [See WR 103: 67.] It is reprinted in order to provide wider distribution among the members of the Wildlife Disease Association and to test its usability in this microform. Single copies are not available from the Association unless further arrangements are negotiated with original publisher (Cambridge University Press).--From abstr.

Lauckhart, J. Burton. (Wash. State Game Dept., Olympia.) WATERFOWL POPULATION CHANGES. Proc. 40th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 157-160. 1960 [1961]. WR 105: 41

From 1936 to 1953 the yearly inventory populations of waterfowl in Wash. ranged between 300,000 and 600,000 and averaged about 450,000 waterfowl. A general upward trend started in 1954 and attained an alltime high of 1,224,000 in 1960. Almost all of this increase in waterfowl wintering in Wash. has been the result of mallard increases which reflect the increase in corn production in that state. The conclusion is reached that the wintering area capacity and not the nesting area nor the hunting kill is setting the limits for waterfowl in the Pacific Flyway.

Marquardt, Richard E. (Okla. Coop. Wildl. Res. Unit, Stillwater.) IDENTIFICATION OF AGE CLASSES OF CANADA GEESE IN FIELD FLOCKS. J. Wildl. Mgmt. 26 (1): 96-97. Jan. 1962. WR 105: 42

Certain characteristic plumage differences capable of distinguishing immature and adult (one year and older) age classes of Canada geese, Branta canadensis spp., in field flocks are discussed. At distances of 10 to 50 feet, with the unaided eye, use of the criteria proved 100% efficient in separating more than 700 autumn specimens of Canada geese into immature or adult age classes. With the aid of suitable optical equipment the criteria of age class difference could be discerned in flocks of Canada geese at distances up to 400 yards. It is believed that use of this technique can provide a means of obtaining age ratio data that are unbiased by differential susceptibility of age classes to hunting mortality and trapping methods.--Author.

Nelson, Noland F. (Utah Fish & Game Dept., Hooper.) HISTORY OF WATERFOWL HUNTING IN UTAH. Proc. 39th Ann. Conf. W. Assoc. State Game & Fish Comms. p. 233-236, 2 figs. 1959 [1960]. WR 105: 42

Seasons, bag limits and other information on waterfowl hunting in Utah for the period 1876 to 1958 are summarized.

Page, Calvin A., and John J. Lynch. A LABORATORY STUDY OF AN ARKANSAS DUCK DIE-OFF. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 161-164. 1959 [1961]. WR 105: 42

The laboratory findings indicate that a mallard "die off" in Ark. during Jan. 1956 was due primarily to 3 causes: lead poisoning, crop engorgement suggesting "impaction", and a micro-biological agent.

Schlichting, Harold E., Jr. (Mich. State Univ., East Lansing.) A NEW TECHNIQUE TO STUDY THE ROLE OF WATERFOWL IN THE DISPERSAL OF ALGAE. 9th Congr. Intern. Bot. 2: 346-347. 1959. [From Biol. Abstr. 36(23), 1961.] WR 105: 42

Abstract.

Wright, Thomas Wayne. (SCS, Little Rock, Ark.) WINTER FOODS OF MALLARDS IN ARKANSAS. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 291-296. 1959 [1961]. WR 105: 42

A total of 583 mallard gullets was examined during the 1957-8 and 1958-9 hunting seasons to determine the foods of the mallard in Central Ark. (one of the major rice-growing and duck-wintering areas in the U. S.). Weather conditions affected the food percentages. Ducks ate acorns more during the wet year, 1957, when all bottomlands were flooded by heavy rains. A summary of land management for ducks in rice fields, woodland, and special planted duck-fields is given. Experience with special duck-fields planted to browntopmillet is included. The browntopmillet proved to be a choice food of mallards when managed properly. Experience with other duck-fields including corn, soybeans, and grain sorghums is also given. The study indicates the importance of rice and associated plants in feeding mallards. Rice and grass seeds associated with rice culture accounted for 65.9% of the foods eaten. Other winter foods and their relative importance are given.--From summ.

Wright, Thomas Wayne. (SCS, Little Rock, Ark.) WEIGHTS OF MALLARDS IN ARKANSAS. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 14-17. 1960 [1962]. WR 105: 42

The weights of 3,425 mallard ducks collected during 1957-8 and 1958-9 from adjacent areas in Ark., showed little seasonal or other fluctuations in weights from the first to the last of the hunting season. A slight decline occurred in weights each year in Jan. Ark. mallard ♂♂ averaged 2.8 pounds and ♀♀ averaged 2.4 pounds. Food availability in the Stuttgart area may have influenced the size of the mallards as they were larger at Stuttgart than at Little Rock. Rice, acorns, and other choice foods of mallards are generally more abundant in the Stuttgart area than in the Little Rock area.--From summ.

Yocum, Charles F., and Eley P. Denson, Jr. (Humboldt State Coll., Arcata, Calif.) IMPORTANCE OF NORTHWEST COASTAL CALIFORNIA TO WATERFOWL. Calif. Fish & Game 48(1): 65-76, 5 figs. Jan. 1962. WR 105: 43

The NW coast of Calif. is not an important breeding area for waterfowl because of limited suitable habitat. Ducks which commonly nest in this area are mallards, wood ducks, cinnamon teal, and American mergansers. Portions of this area are important wintering places for many ducks of which widgeons, pintails, and black brant are the most numerous. Thousands of migrants of many species pass through the area.--From summ.

CRANES, RAILS, SHOREBIRDS

Baerends, G. P., and J. M. Baerends-Van Roon. UEBER DIE SCHNAPPBEWEGUNG DES FISCHREIHERS, ARDEA CINEREA L. [THE SNAPPING OF THE HERON, ARDEA CINEREA L.] Ardea 48(3/4): 136-150. 1960. [From Biol. Abstr. 36(24), 1961.] WR 105: 43

[In German.]

Boeker, Erwin L., John W. Aldrich, and William S. Huey. (Denver Wildl. Res. Center, Denver, Colo.) STUDY OF EXPERIMENTAL SANDHILL CRANE HUNTING SEASON IN NEW MEXICO DURING JANUARY 1961. US F&WS, Spec. Sci. Rept.--Wildl. no. 63. iii + 24 p., 1 fig. Aug. 1961. WR 105: 43

Abstract: The first open season for hunting sandhill cranes in the United States was permitted during Jan. 1961, in the eastern counties of N. Mex. The population of these birds in the area of hunting was 150,000 before the season opened. After one week of hunting and throughout the remainder of the season the population dropped to 1,500 birds due to moving out of the area into west Texas. An estimated 1,446 hunters participated and shot an estimated 542 cranes, or 1.7% of those present in the area. Weights and measurements of all cranes which passed through checking stations indicated none of the race known as greater sandhill crane had been taken. Sex ratio of checked cranes was 59 males to 60 females. Age ratio was 107 adults to 30 immatures. Food eaten consisted almost entirely of grain sorghums and green alfalfa.

Boeker, Erwin L., William S. Huey, and John W. Aldrich. (Denver Wildl. Res. Center, Denver, Colo.) THE 1961 SANDHILL CRANE HUNT. Proc. 41st Ann. Conf. W. Assoc. State Game & Fish Comms. p. 154-158. 1961 [1962]. WR 105: 43

See Boeker, Aldrich, and Huey (listed above) for a more detailed report on this hunt.

Meanley, Brooke. (Patuxent Wildl. Res. Center, Laurel, Md.) PELLET CASTING BY KING AND CLAPPER RAILS. Auk 79(1): 113, 1 fig. Jan. 1962. WR 105: 43

Pellets contained exoskeletal fragments of crayfish, red-jointed fiddler crab, aquatic insects and shell fragments of a clam.

Neely, William W. (SCS, Walterboro, S. C.) SNIPE FIELD MANAGEMENT IN THE SOUTHEASTERN STATES. Proc. 13th Ann. Conf. SE Assoc. Game & Fish Comms. p. 288-291. 1959 [1961]. WR 105: 43

Management for snipe requires the production of vegetation left in a close-cropped condition, and a dependable food supply. Methods to favor earthworms and other animal life must be used. Natural vegetation is a ready source of humus. Water control for depth-of-flooding is important. A puddled field condition is the most desirable. Flashboard risers, along with a suitable water source, best serve the water control needed. The lack of suitable wintering grounds is suggested as the limiting factor for snipe.--From summ.

REPTILES AND AMPHIBIANS

Bellis, Edward D. (Pa. State Univ., University Park.) COVER VALUE AND ESCAPE HABITS OF THE WOOD FROG IN A MINNESOTA BOG. Herpetologica 16(4): 228-231, 1 fig. 20 Jan. 1962. WR 105: 44

Escape values of cover types ranked as follows: calla, tamarack, pine, spruce and tamarack, spruce, shrub, and fir. Analysis of capture-recapture data indicated that distances between successive captures were generally small and the average home-range of Rana sylvatica was 77.2 square yards.

Brandon, Ronald A. (Univ. Ill., Urbana.) A COMPARISON OF THE LARVAE OF FIVE NORTHEASTERN SPECIES OF AMBYSTOMA (AMPHIBIA, CAUDATA). Copeia 1961(4): 377-383, 2 figs. 22 Dec. 1961. WR 105: 44

Breckenridge, Walter J., and John R. Tester. (Univ. Minn., Minneapolis.) GROWTH, LOCAL MOVEMENTS AND HIBERNATION OF THE MANITOBA TOAD, BUFO HEMIOPHRYS. Ecology 42(4): 636-646, 10 figs. Autumn 1961. WR 105: 44

Toads were found to be of adult size on emergence from their 2nd period of hibernation at about 23 months of age. Growth was rapid the first season, markedly less the 2nd, and extremely slow thereafter. Local movements were studied mainly by using scintillation counters to follow toads marked with radioactive Ta^{182}. These toads lived in or near the margins of prairie ponds. About 84% of the 276 daily movements recorded were 100 feet or less while 4% were more than 200 feet. All toads followed hibernated on the upland 75 to 115 feet from the pond margins. "Mima"-type mounds were used extensively in hibernation. Movements during the winter and emergence from hibernation are described.--From summ.

Carpenter, Charles C. (Univ. Okla., Norman.) PATTERNS OF SOCIAL BEHAVIOR IN THE DESERT IGUANA, DIPSOSAURUS DORSALIS. Copeia 1961(4): 396-405, 4 figs. 22 Dec. 1961. WR 105: 44

Display behavior, dominance, tail slapping aggression, courtship, mutual abdominal-contact behavior and the behavior of juveniles are featured in this study of desert iguana.

Carpenter, Charles C. (Univ. Okla., Norman.) PATTERNS OF SOCIAL BEHAVIOR OF MERRIAM'S CANYON LIZARD (SCELOPORUS M. MERRIAMI-IGUANIDAE). Southwestern Nat. 6(3-4): 138-148, 3 figs. 29 Dec. 1961. WR 105: 44

Abstract: The social behavior of a group of 19 canyon lizards, Sceloporus merriami, was observed in a large enclosure. The pattern of movements and the cadence of these movements in the display sequence are species-specific. The dominant male is responsible for the majority of aggressive actions such as displaying, courting, fighting, and chasing in the group. Subordination is indicated by retreat, submission and reduced activity. Dominance was shared by two males, and when they were removed a new dominant male arose and maintained his dominance when the previous dominants were returned. A courting male nods rapidly while following a female and attempts to get a biting grip on the skin of her shoulder region to effect copulation. One observation suggests that the female may sometimes initiate courtship and mating.

Carpenter, Charles C. (Univ. Okla., Norman.) PATTERNS OF BEHAVIOR IN TWO OKLAHOMA LIZARDS. Am. Midland Nat. 67(1): 132-151, 2 figs. Jan. 1962. WR 105: 44

Behavior patterns of Sceloporus undulatus, and to a lesser degree those of Cnemidophorus sexlineatus, are described, and comparisons of these two species that share the same habitat are made.

Clarke, Gary K. (Midwest Res. Inst., 425 Volker Blvd., Kansas City 10, Mo.) REPORT ON A BITE BY A RED DIAMOND RATTLESNAKE, CROTALUS RUBER RUBER. Copeia 1961(4): 418-422, 1 fig. 22 Dec. 1961. WR 105: 44

First detailed case history of a snake bite by this species.

Cunningham, John D. (Univ. Calif., Los Angeles 24.) OBSERVATIONS ON THE NATURAL HISTORY OF THE CALIFORNIA TOAD, BUFO CALIFORNICUS CAMP. Herpetologica 17(4): 255-260, 1 fig. 20 Jan. 1962. WR 105: 45

Miscellaneous observations incidental to field studies of the period 1952-1961 are grouped under headings of habitat, activity, reproduction, and thermal ecology. Nocturnally-active adults are more frequently the same temperature as their substrate than the diurnally-active young. Adult toads are sometimes the warmest object within the microhabitat. Diurnally, the usual pattern is for the young toads to be the coolest objects within the microhabitat.

De Poe, Charles E., John B. Funderburg, Jr., and Thomas L. Quay. (N. C. State Coll., Raleigh.) THE REPTILES AND AMPHIBIANS OF NORTH CAROLINA: A PRELIMINARY CHECK LIST AND BIBLIOGRAPHY. J. Elisha Mitchell Sci. Soc. 77(2): 125-136. Nov. 1961. WR 105: 45

The herpetofauna of N. C. is composed of 158 spp. and ssp. recorded and another 11 forms which may possibly occur but which currently appear doubtful. Extensive bibliography.

Duellman, William E. THE AMPHIBIANS AND REPTILES OF MICHOACÁN, MÉXICO. Univ. Kans. Publ., Museum Nat. Hist. 15(1): 1-148, 11 figs. + 6 pls. 20 Dec. 1961. WR 105: 45

This is the first of a two-part report on the herpetofauna of Michoacán. It includes accounts of the forms found there and brief descriptions of the natural landscape and of the various assemblages of species comprising the major faunistic groups within the region. A gazetteer of collecting localities is appended. Part two will deal with the ecological and historical geography of the herpetofauna.

Heath, Wallace G. (Univ. Ariz., Tucson.) A TRAILING DEVICE FOR SMALL ANIMALS DESIGNED FOR FIELD STUDY OF THE GILA MONSTER (HELODERMA SUSPECTUM). Copeia 1961(4): 491-492, 1 fig. 22 Dec. 1961. WR 105: 45

A description of the construction and use of a tailspool which is "attachable with no apparent discomfort or annoyance to the animal.... [and] is of sufficient range for one or more twenty-four hour periods and sufficiently compact to follow the animal into subterranean burrows without impeding its progress."

Herreid, Clyde F. II. (Pa. State Univ., University Park.) SNAKES AS PREDATORS OF BATS. Herpetologica 17(4): 271-272. 20 Jan. 1962. WR 105: 45

Five species of snakes were observed to prey on free-tailed bats: Central Texas whipsnake, Masticophis taeniatus ornatus; western coachwhip, M. flagellum testaceus; Great Plains rat snake, Elaphe guttata emoryi; broad-banded copperhead, Agkistrodon contortrix laticinctus; and the Texas rat snake, Elaphe obsoleta lindheimeri.

Holman, J. Alan, and William Holmes Hill. (Ill. State Univ., Normal.) A MASS UNIDIRECTIONAL MOVEMENT OF NATRIX SIPEDON PICTIVENTRIS. Copeia 1961(4): 498-499. 22 Dec. 1961. WR 105: 45

In summary, 128 out of 130 Natrix sipedon pictiventris were observed moving in the same direction during evening observations made on two successive June 1961 nights. The reason for this movement appears to be associated with a condition of general drought in the Gainesville, Fla. area.

Jones, Jeanne, and Bayard H. Brattstrom. (Adelphi Coll., Garden City, N. Y.) THE CALL OF THE SPRING PEEPER, HYLA CRUCIFER, IN RESPONSE TO A RECORDING OF ITS OWN VOICE. Herpetologica 17(4): 246-250, 2 figs. 20 Jan. 1962. WR 105: 45

Conclusions: 1. Hyla crucifer males called more during the first 15 minutes in response to a recording of their voices than during the following 15 minutes without the recording. This suggests than an auditory stimulus may be a secondary factor involved in the calling of males. 2. While the recorder was being played to the treefrogs, the greatest per cent of calling occurred in direct response to calls from the recorder. 3. Treefrogs in covered containers

called more than those in uncovered ones. This, plus our field tests, suggest that motion of an object is primarily responsible for cessation of a chorus. 4. Treefrogs used in this test called for a much longer period of time in captivity than usual. This may have resulted from the effect of the recording.

Ligas, Frank J. (Fla. Game & Fresh Water Fish Comm., Tallahassee.) THE EVERGLADES BULLFROG / LIFE HISTORY AND MANAGEMENT. Proc. 14th Ann. Conf. SE Assoc. Game & Fish Comms. p. 9-14, 1 fig. 1960 [1962]. WR 105: 46

The study techniques, life history, harvest and management of the bullfrog in Fla. are described. "Proper water level regulation is the key to frog management in the Everglades. Water depths should be not less than 1.5 feet in November and one foot in May. Controlled burning during favorable water and weather conditions is beneficial by opening up areas to frogging that are too dense to penetrate with an airboat. An increase in the alligator population would benefit frogs and other fauna by creating numerous deep water holes which serve as reservoirs for tadpoles and other organisms in dry periods. For this reason continued and increased protection is desirable. Experimental introduction work on the bullfrog Rana catesbeiana should be carried out on a limited scale. It may be possible to introduce this species into the numerous canals and borrow pits of south Florida." The crayfish is one of the most important food items of frogs.

Livezey, R. L. (Sacramento State Coll., Sacramento, Calif.) FOOD OF ADULT AND JUVENILE BUFO BOREAS EXSUL. Herpetologica 17(4): 267-268. 20 Jan. 1962. WR 105: 46

Juvenile toads eat more small food materials than the adults, as well as more larval stages of dipterans and coleopterans. Juvenile toads consumed considerably greater absolute numbers of food items.

Martof, Bernard S. (Univ. Ga., Athens.) THE BEHAVIOR OF FOWLER'S TOAD UNDER VARIOUS CONDITIONS OF LIGHT AND TEMPERATURE. Physiol. Zool. 35(1): 38-46, 2 figs. Jan. 1962. WR 105: 46

Martof, Bernard S. (Univ. Ga., Athens.) SOME ASPECTS OF THE LIFE HISTORY AND ECOLOGY OF THE SALAMANDER LEUROGNATHUS. Am. Midland Nat. 67(1): 1-35. Jan. 1962. WR 105: 46

Varied treatment of the habitat, distribution, collection methods, description, reproduction, and life history of Leurognathus. Leurognathus is more diurnal than most terrestrial salamanders. Instead of seeking cover Leurognathus swim away when attacked. Speculations on the relationship of this genus to other Desmognathinae are presented.

Metter, Dean E. (Univ. Idaho, Moscow.) WATER LEVELS AS AN ENVIRONMENTAL FACTOR IN THE BREEDING SEASON OF BUFO BOREAS BOREAS (BAIRD AND GIRARD). Copeia 1961(4): 488. 22 Dec. 1961. WR 105: 46

"Along the Snake River canyon in eastern Washington and northwestern Idaho, water conditions play such an important role in determining the breeding season of B. b. boreas that temperature appears to have a negative correlation."

Schuierer, Frederick W. (Cabrillo Coll., Watsonville, Calif.) REMARKS UPON THE NATURAL HISTORY OF BUFO EXSUL MYERS, THE ENDEMIC TOAD OF DEEP SPRINGS VALLEY, INYO COUNTY, CALIFORNIA. Herpetologica 17(4): 260-266, 3 figs. 20 Jan. 1962. WR 105: 46

Breeding, development and growth, effects of temperature, population size, behavior, and color and form are considered in this study made during 1954-1961.

Schwartz, Frank J. (Chesapeake Biol. Lab., Solomons, Md.) MARYLAND TURTLES. Md. Dept. Res. & Educ., Educational Ser. no. 50. 44 p., illus. 1961. WR 105: 46

Information on the identification, distribution, life history, biology, and economic value of the 21 forms of turtles recorded for Maryland.

Smith, Philip W. (Ill. Nat. Hist. Surv., Urbana.) THE AMPHIBIANS AND REPTILES OF ILLINOIS. Ill. Nat. Hist. Surv. Bull. 28(1). iii + 298 p., 252 figs. Nov. 1961. $3.00. WR 105: 47

Information on the diagnosis, variation, habits, and Ill. distribution of each of the 109 forms that make up the herpetofauna of this state.

Taub, Frieda B. (Univ. Wash., Seattle.) THE DISTRIBUTION OF THE RED-BACKED SALAMANDER, PLETHODON C. CINEREUS, WITHIN THE SOIL. Ecology 42(4): 681-698. Autumn 1961. WR 105: 47

Thien, J. A. (Univ. Notre Dame, Notre Dame, Ind.) OSTEOLOGICAL OBSERVATIONS ON NEW WORLD BUFO. Am. Midland Nat. 67(1): 157-183, 38 figs. Jan. 1962. WR 105: 47

The 51 recognized New World forms of Bufo are classified into 5 major species groups on the basis of skeletal characteristics.

Voss, William J. (Texas Technol. Coll., Lubbock.) RATE OF LARVAL DEVELOPMENT AND METAMORPHOSIS OF THE SPADEFOOT TOAD, SCAPHIOPUS BOMBIFRONS. Southwestern Nat. 6(3-4): 168-174, 2 figs. 29 Dec. 1961. WR 105: 47

Manuscript for this issue was completed 29 March 1962

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